

Amphibian and Reptile Survey
of the
Bureau of Land Management
Miles City District, Montana

A Report to:

Bureau of Land Management

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and

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ABSTRACT

During 1995 and 1998, a total of 110 site surveys for amphibians and reptiles were conducted by Montana Natural Heritage Program biologists in the Bureau of Land Management Miles City District (the former Billings, Big Dry and Powder River Resource Areas) in eastern Montana. During the 1998 contract period, 102 site surveys were conducted (8 of these were nocturnal roadside call surveys, 94 were standard surveys) during April to July. All surveys were conducted by one individual. Surveys took from 5 to 180 minutes (mean = 58.5 min) and consisted of a thorough search of the wetland perimeter in combination with netting of near shore aquatic habitats for adults, eggs, larvae, and tadpoles. Sampling was done by hand and dipnet. At seeps, rocks and logs were overturned in and near wet areas to expose hidden individuals. In addition to site surveys, observations of road kills were recorded, as were fortuitous sightings by those conducting the surveys or other reliable individuals.

Ten species (6 amphibian and 4 reptile) were detected within the Miles City District area during 1998 site surveys. Species included: Tiger Salamander (*Ambystoma tigrinum*), Woodhouse's Toad (*Bufo woodhousii*), Great Plains Toad (*Bufo cognatus*), Western Chorus Frog (*Pseudacris triseriata*), Plains Spadefoot (*Spea bombifrons*), Northern Leopard Frog (*Rana pipiens*), Painted Turtle (*Chrysemys picta*), Racer (*Coluber constrictor*), Plains Garter Snake (*Thamnophis radix*), and Common Garter Snake (*Thamnophis sirtalis*). Four reptile species encountered in 1998 other than on site surveys include Smooth Green Snake (*Liochlorophis vernalis*), Gopher Snake (*Pituophis catenifer*), Western Hognose Snake (*Heterodon nasicus*), and Western Rattlesnake (*Crotalus viridis*). In addition, Short-horned Lizard (*Phrynosoma hernandesi*), Sagebrush Lizard (*Sceloporus graciosus*), and Western Terrestrial Garter Snake (*Thamnophis elegans*) were reported from the Miles City District by other observers in 1998. In 1995, 3 species were detected during 8 site surveys in Carbon County: Tiger Salamander, Western Chorus Frog, and Plains Spadefoot. Short-horned Lizard, Sagebrush Lizard, Gopher Snake, and Western Rattlesnake were also encountered, but not during surveys.

Of the 1998 surveys, 95.1% had one or more amphibian or reptile species present. Western Chorus Frog, Northern Leopard Frog, and Plains Garter Snake were the most frequently encountered species in 1998, being recorded on 67.6%, 61.7%, and 22.3%, respectively, of the site surveys. Species with records from the Miles City District area, but not encountered during the 1995 and 1998 surveys, include Bullfrog (*Rana catesbeiana*), Common Snapping Turtle (*Chelydra serpentina*), Spiny Softshell (*Trionys spiniferus*), and Milk Snake (*Lampropeltis triangulum*).

Western Toad (*Bufo boreas*), Columbia Spotted Frog (*Rana luteiventris*), and Rubber Boa (*Charina bottae*), all with montane affinities, have been documented but are marginal to the Miles City District in the west. The Canadian Toad (*Bufo hemiophrys*), although recorded from the Miles City District area in 1966, is now considered historical (not reported in >30 years). Wood Frog (*Rana sylvatica*) might be documented eventually from the Miles City District area in the Big Horn Mountains of Big Horn County.

ACKNOWLEDGMENTS

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Financial support for the project came from a Challenge Cost-Share agreement between the Bureau of Land Management and the Montana Natural Heritage Program (Montana State Library, Natural Resources Information System and The Nature Conservancy). Funds for additional survey work on National Wildlife Refuge and Waterfowl Production Area lands within the Miles City District, BLM region were provided from an additional Challenge Cost-Share agreement with the Montana Office of the USFWS.

Museum records were received from: American Museum of Natural History, Academy of Natural Science, Brigham Young University, California Academy of Science, Carnegie Museum, University of Puget Sound Museum, Field Museum of Natural History, Glacier National Park Museum, Illinois Natural History Survey, University of Kansas, Los Angeles County Museum, Louisiana State University Museum of Zoology, Museum of Comparative Zoology - Harvard, Milwaukee Public Museum, Montana State University Museum, Michigan State University Museum, North Carolina State Museum of Natural History, Northern Louisiana University Museum, University of Colorado Museum, University of Georgia Museum of Natural History, University of Idaho Museum, University of Michigan Museum, University of South Dakota, United States National Museum of Natural History, University of Texas - Arlington, University of Texas - El Paso, and Peabody Museum - Yale. Most museum data were received with the help of Dr. Charles Peterson, Idaho State University, Pocatello.

Jim Reichel, former MTNHP Zoologist, was instrumental in organizing and conducting a series of amphibian and reptile inventories across Montana, the first comprehensive coverage of the state in three decades, and by far the most uniform and complete. Jim's untimely death in 1997 prevented his direct involvement in completing this portion of the overall project. This report represents one of a series of regional inventories that contribute to a baseline survey of the entire state.

INTRODUCTION

Populations of several amphibian species are currently declining in the western U.S. and elsewhere around the world. Acid rain, ozone depletion, pollution by toxic chemicals and heavy metals, predation and/or competition by exotic species, habitat alteration, climatic changes, disease, immune system problems, and combinations of several of these factors have all been suggested as possible causes (Corn and Fogelman 1984, Phillips 1990, Yoffe 1992). Recognition of these alarming population trends has renewed interest in the status amphibian populations in particular, and raised awareness regarding current ignorance of the status of many reptile species as well.

The amphibians and reptiles occupying the plains of eastern Montana have received scant attention by naturalists and biologists. As a consequence, we know very little about the status, population trends, habitat requirements, and reproductive biology of many species within this region of the state. With new information acquired in the last 5 years from a series of regional inventories of the herpetofauna in eastern Montana (e.g., Reichel 1995b, Hendricks and Reichel 1996, Hendricks and Reichel 1998, Roedel and Hendricks 1998), we are gaining an understanding of abundance and population trends for several species, and are "fleshing out" known distributions that were largely based on opportunistic encounters and other data at least half a century old.

In 1805-1806 Lewis and Clark were the first to document the presence of Spiny Softshell (*Trionyx spiniferus*), Eastern Short-horned Lizard (*Phrynosoma hernandesi*), Western Hognose Snake (*Heterodon nasicus*), Western Terrestrial Garter Snake (*Thamnophis elegans*), and Western Rattlesnake (*Crotalis viridis*) along the Missouri River in present-day eastern Montana (Burroughs 1995). Most additional published accounts of amphibians and reptiles in eastern Montana are concentrated along the Missouri River corridor and its tributaries. Notable among these reports is that of Cope (1879), who commented on the occurrence of 5 amphibian and 3 reptile species between the Judith River and Armells Creek. More recently, Mosimann and Rabb (1952) documented the presence of 4 amphibian and 7 reptile species in the Tiber Reservoir area along the Marias River of northcentral Montana. The written record of exploration of Montana in the 19th century and first half of the 20th century, and unpublished museum collection records, provide the base for analyses of historical distributions and population trends. Additional distribution and status information for border regions can be gleaned from Wheeler and Wheeler (1966) for North Dakota, Visser (1914) for South Dakota, Baxter and Stone (1985) for Wyoming, and Secoy and Vincent (1976) for Saskatchewan.

Preliminary data gathered from site surveys and revisits to historical sites indicate that the Northern Leopard Frog (*Rana pipiens*) has disappeared over much of its former range in western Montana (Werner et al. 1998) and is declining in at least some areas of eastern Montana. Status and population trend of several toad species (*Bufo* spp.) are unknown, although declines of the Western Toad (*Bufo boreas*) have recently been reported in northern Idaho (C. Peterson pers. comm.), northwestern Montana (Werner and Reichel 1994, Werner et al. 1998), Yellowstone National Park (Koch and Peterson 1995) and Colorado (Carey 1993).

Land-use practices, such as large-scale logging, continue to be detrimental to resident amphibians

in some regions of the western U.S. (Bury et al. 1991). The impacts of grazing on amphibians and reptiles and their habitats remain poorly studied and understood. Heavy grazing in and around breeding sites associated with water may negatively impact amphibians and reptiles by 1) eliminating emergent vegetation necessary for egg and larval survival, 2) lowering water quality, especially causing high siltation levels, 3) trampling of eggs, larvae and adults, and 4) degrading the amphibian and reptile food base. Additionally, modification of seeps and springs for livestock watering, by capturing water flow in tanks, may make former breeding sites unusable by amphibians.

Inventory of the Miles City District, BLM was undertaken to survey for amphibian and reptile species in a large region of eastern Montana for which there are only rudimentary data on the status and distribution of most species. Several historical Northern Leopard Frog sites were also visited to determine if this species was still present. Concurrent with site surveys, a variety of data on the physical characteristics of each site was recorded; these data help identify habitat needs of selected species. Management suggestions are presented that pertain to habitat enhancement for selected species. Limitations in current knowledge and future information needs are also addressed.

The Montana Natural Heritage Program currently (1998) lists five amphibian and five reptile species as Animal Species of Special Concern. Of these, two amphibian and five reptile species have been documented within the borders of the Miles City District, BLM. They are Canadian Toad (*Bufo hemiophrys*), Northern Leopard Frog (*Rana pipiens*), Common Snapping Turtle (*Chelydra serpentina*), Spiny Softshell (*Trionyx spiniferus*), Western Hognose Snake (*Heterodon nasicus*), Milk Snake (*Lampropeltis triangulum*), and Smooth Green Snake (*Liophorophis* [= *Opheodrys*] *vernalis*). The toad, two turtle species, and Milk Snake are also listed as BLM Special Status Species for Montana and the Dakotas.

STUDY AREA AND METHODS

The BLM's Miles City District (comprised of the former Billings, Big Dry, and Powder River Resource Areas) was surveyed during the 1998 inventory; portions of the Billings Resource Area in Carbon County were surveyed in 1995, and those data are included in this report. The area bounded by the Miles City District is huge, stretching from near Yellowstone National Park in the southwest to Saskatchewan in the northeast, and bordered by North Dakota and South Dakota to the east, and Wyoming to the south. Land cover of the District is mostly agricultural lands, grasslands, or shrublands, with scattered pine forests in the south, and riparian gallery forest and other riparian types along major drainages, such as the Missouri and Yellowstone rivers and their tributaries. Elevation is generally below 5000 ft (1500 m), but the southwestern corner of the Miles City District encompasses several mountain uplifts (such as the Big Horn, Pryor, and Beartooth mountains).

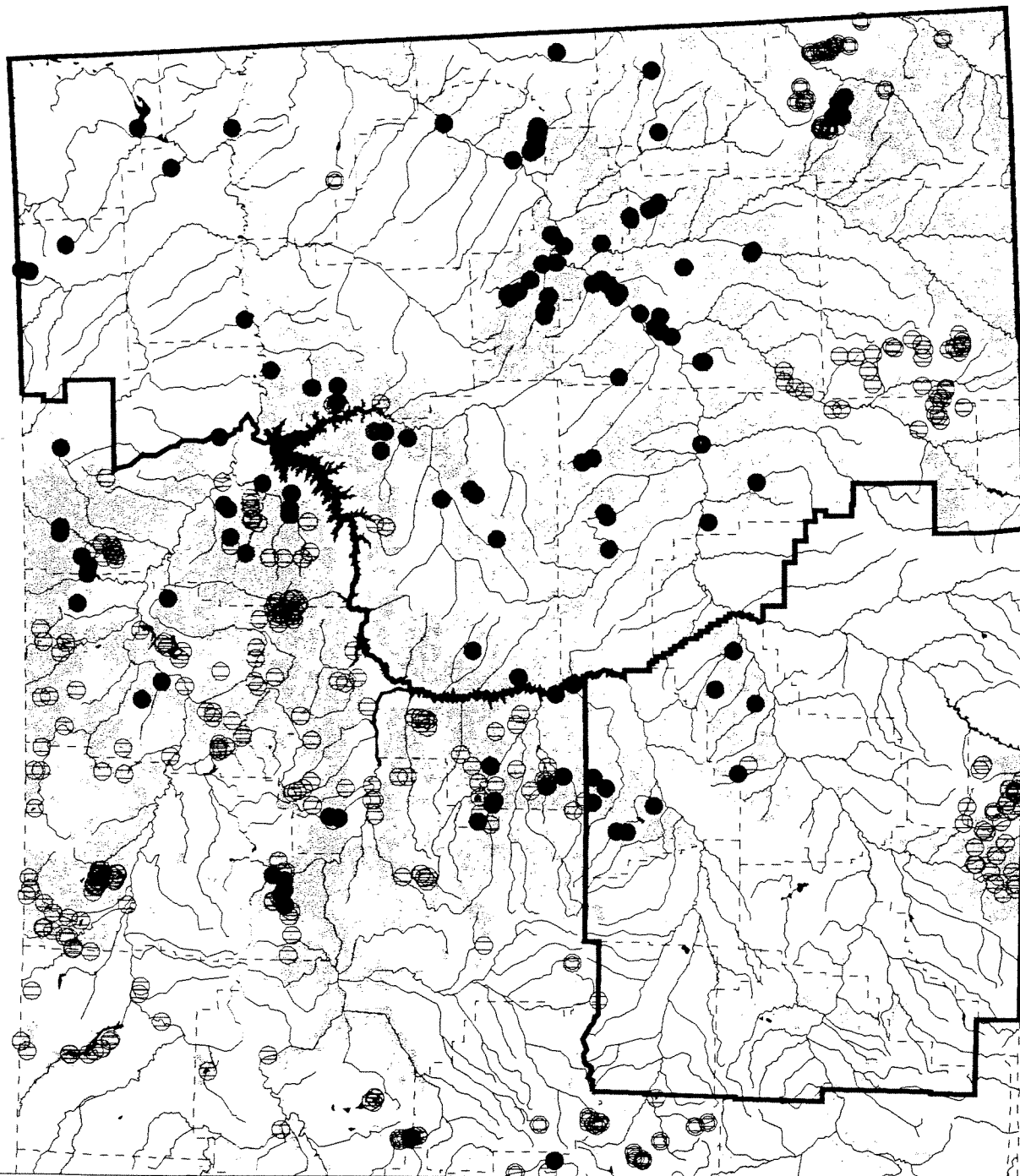
Historical records from museum collections can be very useful in determining long-term changes in populations or shifts in biodiversity (Shaffer et al. 1998). Historical locations of amphibians and reptiles were recorded from the literature (see Bibliography) and museum specimen records. Records were received from over 20 major North American museums that have computerized their collection records (see Acknowledgments). Locations derived from these sources have been entered into a database and digitized. Distribution maps were created using survey and sighting data and historical records, including museum specimens.

Survey sites were chosen based on 3 criteria: 1) high priority sites as determined by the BLM; 2) location of streams, seeps and wetlands on topographic maps; and 3) accessibility of the wetlands by roads. Based on the above, 3-6 sites were chosen daily for surveys. From five minutes to 3 hours were spent at each site (mean = 58.5 minutes), depending upon the size of the area and what was found. Initially, the entire shoreline, or a major part thereof, was searched by walking slowly along the edge and up into the surrounding vegetation, including rolling over rocks and logs. At regular intervals, the aquatic habitat was sampled for tadpoles or larvae using dipnets. If the initial sampling showed amphibian/reptile species present, further effort was expended in order to get a more comprehensive view of abundance and distribution.

An attempt was made to capture at least the first few individuals of a species seen at a survey site. The species name was recorded along with developmental stage and sex (if possible); the animals were then released. On occasion, representative samples of the more common species in an area were preserved for permanent museum records and will be deposited at the Idaho State University Museum. Water temperature, air temperature, and a general description of the area were recorded. Standardized data sheets were used during this project; the amphibian survey data sheet was developed by U.S. Fish and Wildlife Service and is used extensively by a variety of researchers in the western U.S. Much site-specific data was gathered during these surveys; not all data has been analyzed or is presented in this report, but is available from the Montana Natural Heritage Program.

Herp Surveys
on the
Miles City District
BLM
1995-1998

- 1998 surveys
- ⊖ 1995-1997 surveys
- Pre-1995 surveys



February 16, 1999
Montana Natural Heritage Program

RESULTS AND DISCUSSION

General Summary

A total of 102 sites was surveyed during the months of April (22 surveys), May (32 surveys), June (34 surveys), and July (14 surveys) in 1998 (see Appendix 1). Eight of the 1998 surveys were roadside nocturnal call surveys, rather than the standard site surveys. Eight additional sites (3 in June, 5 in July) were surveyed on BLM lands in Carbon County in 1995 (see Appendix 3a). Of the total 110 sites, 100 (90.9%) had one or more amphibian or reptile species present (Appendix 2 and 3b). During the 1995 surveys, 3 of the 8 sites (37.5%) had one or more amphibian species present; in 1998, 97 (95.1%) of 102 surveys had one or more amphibian and/or reptile species present. Localized areas across the entire region were covered in the inventory. Although no species were found at 10 sites, their absence may have been due to the time of day, weather conditions, or other factors at the time of sampling.

Ten species (6 amphibian, 4 reptile) were detected during site surveys within the Miles City District, BLM (Table 1). Two amphibian species (Boreal Chorus Frog, *Pseudacris triseriata*, and Northern Leopard Frog, *Rana pipiens*) were the most abundant (detected at > 50% of all site surveys) and widespread, while the Plains Garter Snake (*Thamnophis radix*) was the most abundant and widespread reptile species (detected at > 20% of all site surveys).

TABLE 1. Amphibian and reptile species detected during site surveys on the Miles City District, BLM: 1995 - Carbon County only (Appendix 3a), 1998 - all other counties (Appendix 1).

SPECIES*	PRESENCE: # OF 1998 SURVEYS (94)	PERCENT OF 1998 SURVEYS	PRESENCE: # OF 1995 SURVEYS (8)	PERCENT OF 1995 SURVEYS
AMTI	12	12.8	3	37.5
BUWO	10	10.6	0	0.0
BUCO	6	6.4	0	0.0
PSTR ¹	69	67.6	1	12.5
SPBO	1	1.1	3	37.5
RAPI	58	61.7	0	0.0
CHPI	13	13.8	0	0.0
COCO	4	4.3	0	0.0
THRA	21	22.3	0	0.0
THSI	1	1.1	0	0.0

*AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), BOCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

¹ Numbers are based on 102 total site surveys in 1998, which includes 8 roadside nocturnal call surveys unique for this species.

Survey time at sites ranged from 5 to 180 minutes during 1998 (Appendix 2: mean = 58.5 min., sum = 5,965 min.), and from 5 to 40 minutes in 1995 (Appendix 3b: mean = 18.8 min., sum = 150 min.).

Site survey results tended to support the general observation that emergent vegetation is needed by breeding amphibians. In 1998, amphibians were detected at 14 of 15 sites (93.3%) and 71 of 74 sites (95.9%) with some emergent vegetation present (values are for shoreline emergence of 1-25% and >50%, respectively). Unfortunately, the number of sites with no recorded emergent vegetation was small (4 sites), but amphibians were detected at only 2 (50%) of these. Emergent vegetation provides cover and predator protection for tadpoles, and material upon which eggs can be attached. Water levels are often below the level of emergent vegetation (usually a band of sedges or rushes) at ponds lacking emergent vegetation but with amphibian tadpoles present, suggesting that emergent vegetation was probably present at the time of egg laying.

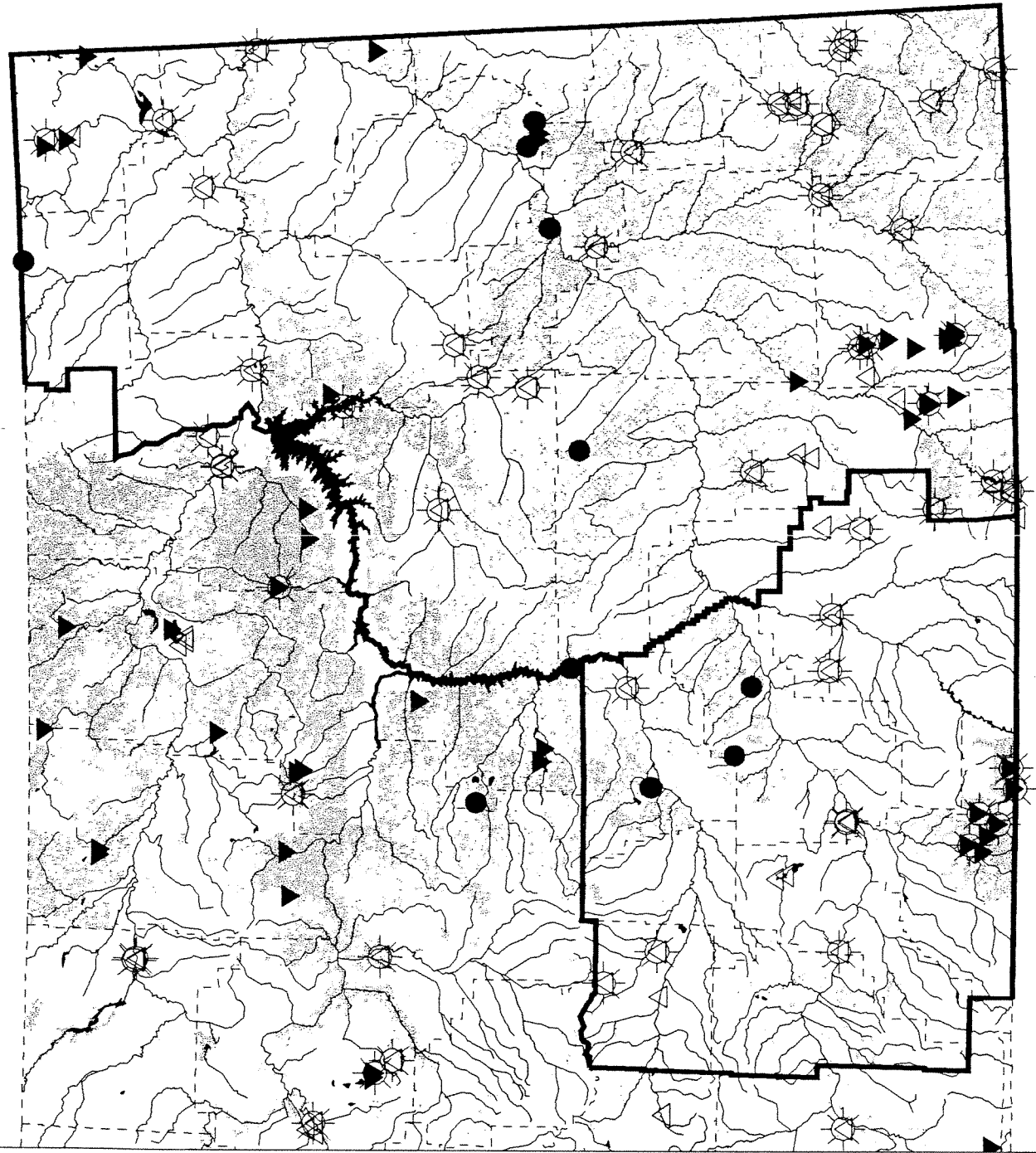
There were 76 opportunistic sightings of 11 species (3 amphibians and 8 reptiles) made by MTNHP personnel during the inventory: 26 sightings of 6 species in 1995 in Carbon County, and 50 sightings of 9 species in 1998 in all other counties (Appendix 4). Of the total for both years, 6 of the reptile species were not reported during any of the site surveys. These species include Short-horned Lizard (*Phrynosoma hernandesi* [= *douglasi*]), Sagebrush Lizard (*Sceloporus graciosus*), Smooth Green Snake (*Liochlorophis* [= *Opheodrys*] *vernalis*), Gopher Snake (*Pituophis catenifer*), Western Hognose Snake (*Heterodon nasicus*), and Western Rattlesnake (*Crotalus viridis*).

More details regarding status, distribution, timing of reproduction, and period of surface activity during the 1998 inventory are presented in the species accounts that follow. Montana Natural Heritage Program Global (G) and State (S) rank codes range from 1 (critically imperiled) to 5 (demonstrably secure, though possibly rare in parts of its range). A question mark (?) indicates that the assigned rank is uncertain.

Observations of
Ambystoma tigrinum
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Species known to be present within the Miles City District, BLM

Tiger Salamander (*Ambystoma tigrinum*)

Description: Adults have a smooth moist skin without scales and the color pattern is highly variable; usually the background color is dark, with lighter blotches of yellow, tan or green. The adult is large and heavy-bodied with a snout-vent length of 3-6". Adult Tiger Salamanders can be separated from other Montana species by: 1) their large sized and heavy body; and 2) two prominent tubercles on the bottom of each hind foot.

Eggs and Larvae: Egg masses are typically laid in small clusters of 5-120, but may be laid singly (Nussbaum *et al.* 1983, Leonard *et al.* 1993). They are usually attached to vegetation and placed 2"-10" below the surface of the water (Hammerson 1982a). Larval Tiger Salamanders are typically pale green or brown-colored, though those living in bentonite clay ponds may be nearly white. They are found in lakes and ponds, have external gills, and are relatively large (0.75-4" snout-vent) and heavy-bodied.

Similar species: None in the Miles City District.

Habitat and Habits: Tiger Salamanders in eastern Montana are primarily associated with prairie or agricultural habitats. On the Sioux and Ashland Districts, Custer National Forest they are also found in wooded draws and ponderosa pine forests (Reichel 1995b, Hendricks and Reichel 1996). They breed in ponds or lakes, usually those without fish present. In arid areas, they may also be found in springs, intermittent streams, and stock ponds. Adults spend much of the day in rodent burrows, becoming active on the surface at night. Larvae were found in ponds from 24 April to 24 July in 1998. Adults may be active relatively late in the year (a Carbon County adult was captured well away from open water on 25 September 1995).

Surveying: Larvae and eggs may be seen in ponds during the day and may be sampled with a dipnet. Migrations of hundreds or thousands of newly transformed adults are occasionally seen in mid-late summer or early fall. During the breeding season, adults are often seen moving to or away from the water or breeding in it. Pitfall and minnow traps may be used to capture adults at this time. In 1995 an adult was captured in a pitfall can trap set for shrews (Appendix 4). Throughout the rest of the summer adults are difficult to find; using pitfall traps or driving roads on warm rainy nights may be the best techniques then.

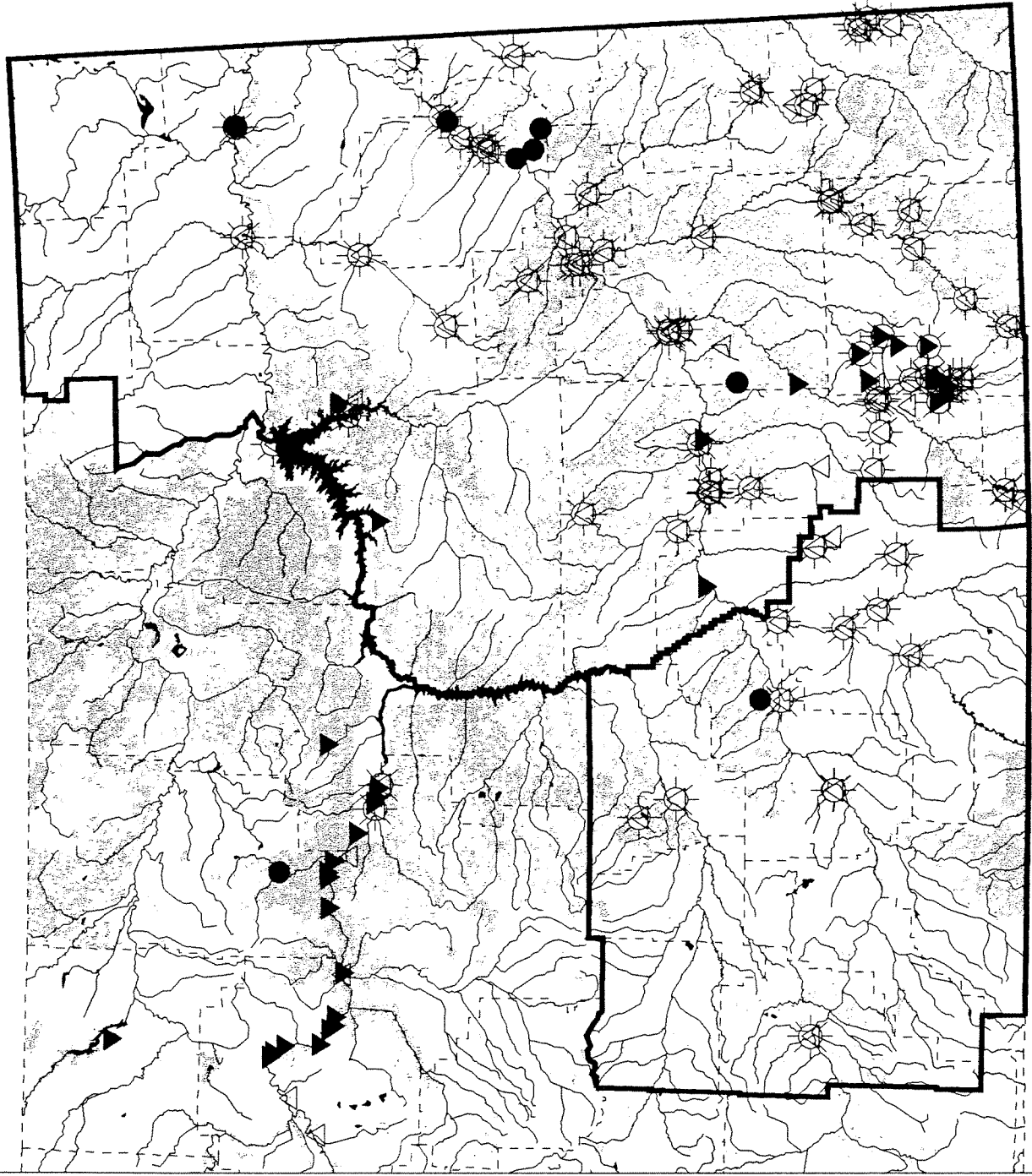
Status: The only salamander in eastern Montana. The species is widespread and probably more abundant than the survey results indicate. On the Miles City District, this species was detected in 6 counties on 12.8% of the 1998 standard surveys and 37.5% of the 1995 Carbon County surveys (Table 1, Appendix 2 and 3b). This species should be considered common on the Miles City District.

Montana Natural Heritage Program rank: G5 S5.

Observations of
Bufo woodhousii
Miles City District
BLM
1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
Montana Natural Heritage Program



Woodhouse's Toad (*Bufo woodhousii*)

Description: Adults have dry skin with small warts, and are gray, brown, or olive-green with paler mottling or spots. A prominent white or yellowish line runs down the center of the back; very young transformed toads typically lack the dorsal line, and the warts are often red-brown in color. It has parallel cranial crests between the eyes and post-orbital crests connecting to them at a right angle behind the eyes; the post-orbital crests typically touch the parotoid glands. If a lump-like boss is present on the snout, it does not extend back between the eyes. The pupils are horizontal. The adult has two black tubercles on the hind feet and a body length of 2.5-4".

Eggs and Tadpoles: Tadpoles are typically jet black. Eggs are laid in long, clear double stings, each egg with a black center.

Similar species: Western Toad lacks cranial crests. Great Plains Toad has large, white-bordered, dark, dorsal blotches. The Canadian Toad has a lump between the eyes; frequently the parotoid gland is separated from post-orbital crest and post-orbital crest broken or absent. **NOTE:** It is very difficult to distinguish among the four Montana toad species in recently transformed toadlets.

Habitat and Habits: Adults are partially terrestrial but often found near water. They are usually found in irrigated agricultural areas and floodplains, versus the upland areas used by Great Plains Toads (Bragg 1940, Timkin and Dunlap 1965, Black 1970). They are most active at night, although they may at times be found out feeding during the day (Hammerson 1982a). They typically breed in permanent lakes, ponds, reservoirs, and slow streams, with a preference for shallow areas with mud bottoms (Black 1970, Hammerson 1982a, Baxter and Stone 1985). Breeding and egg laying is spread out over the spring and early summer. In 1998 on the Miles City District, BLM, adults were observed between 28 April and 23 July, tadpoles were observed from 2 June – 24 July.

Surveying: Adults may easily be found by using their loud calls for identification on warm (>54° F) nights; calling peaks during the first few hours after sunset (Hammerson 1982a). "Road hunting" on warm nights may also be effective. Eggs and tadpoles are seen in ponds and sloughs during the day and can be sampled with a dipnet; however, identification of toad eggs and tadpoles is difficult or impossible in the field.

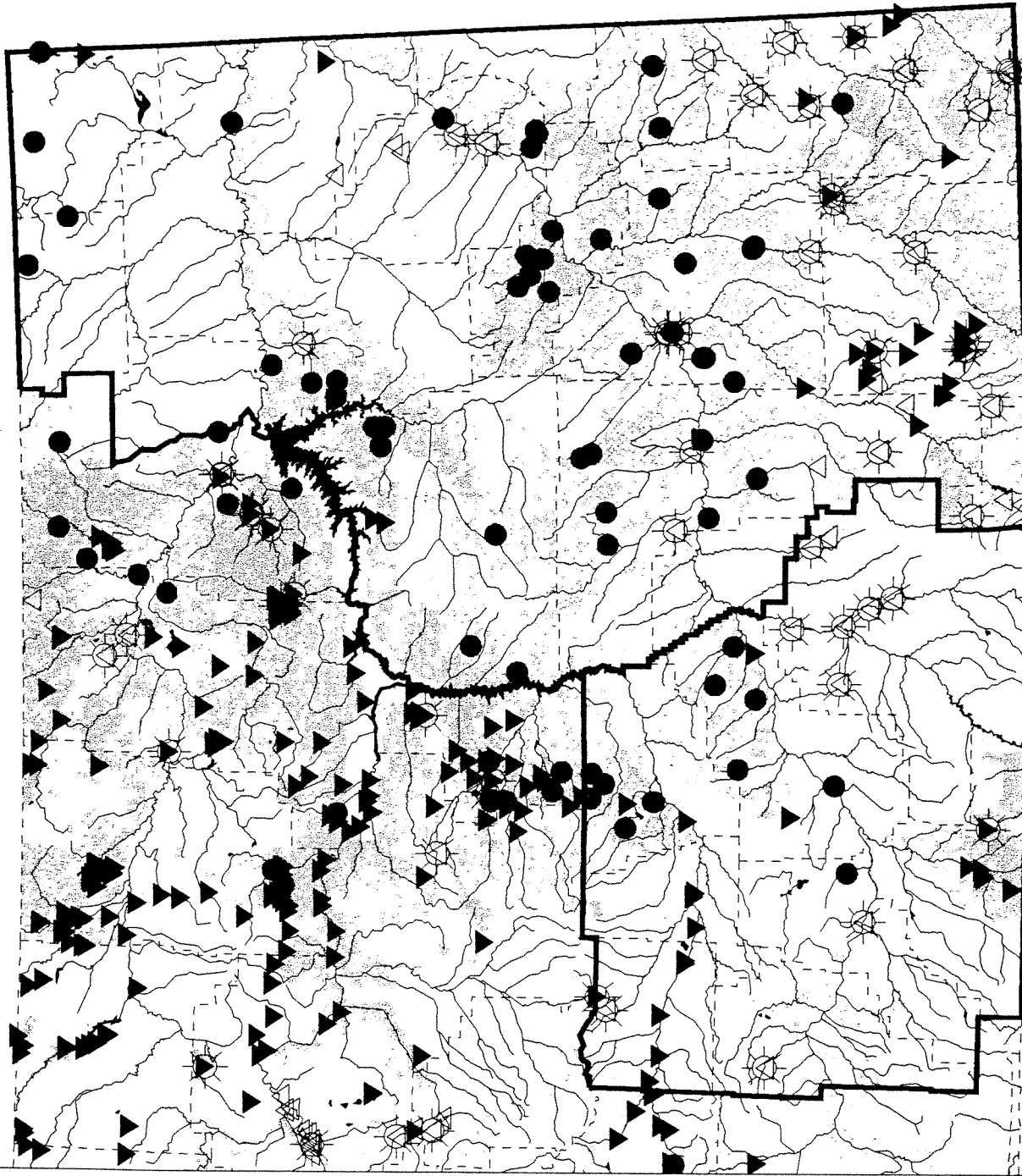
Status: This species was found on 10 surveys in 5 counties in 1998 (Appendix 2). Woodhouse's Toad is relatively common in eastern Montana east of the island mountain ranges, although status and distribution north of the Missouri River is poorly known. It is the most frequently encountered toad in eastern Montana. The geographic and habitat relationships with other toads in Montana are not well known. Any located should be well documented with a description written at the time indicating how this species was differentiated from other toads present in Montana.

Montana Natural Heritage Program rank: G5 S4.

Observations of
Pseudacris triseriata
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Western Chorus Frog (*Pseudacris triseriata*)

Description: Adults are very small (0.75-1.5") and have tiny, almost unnoticeable toe pads. They have a dark line extending from the snout through the eye to the groin. Basic coloration is quite variable with the background color being green, brown, gray, or reddish. Typically 3-5 dark longitudinal stripes are present on the head and back which may be broken up into spots on some individuals.

Eggs and Tadpoles: Eggs are laid in small clusters of 10-100, usually less than 1" across and attached to submerged vegetation (Wheeler and Wheeler 1966, Baxter and Stone 1985). Individual eggs are about 1 mm in diameter. Tadpoles are brown/bronze and the eyes are located on the sides of the head.

Similar species: Has tiny toe pads. Recently metamorphosed Ranid frogs could be confused with this species, but the coloration differs and the tiny toe pads are lacking. Eye position distinguishes the tadpoles.

Habitat and Habits: Western Chorus Frogs are regularly found in the water only during the breeding period in spring. Their presence is obvious during this time due to their call, which is given frequently at night and sporadically throughout the day. Calls were frequently heard until late June. Eggs or tadpoles were found in ponds from 24 April to 22 July in 1998. However, the species was detected (tadpoles) on only 1 of 14 July site surveys. For standard site surveys (i.e., excluding nocturnal roadside call surveys) in 1998 where the species was present ($n = 61$), tadpoles were detected in 1 of 20 April surveys, 12 of 19 May surveys, and 17 of 22 June surveys ($G = 28.016$, $df = 2$, $P < 0.001$), indicating a peak of breeding in May and June. Following breeding, these frogs move into adjacent uplands and are rarely seen. In eastern Montana, they breed in temporary ponds and small lakes surrounded by prairie; in some locations in Montana they are also found in open forested habitats. Eggs hatch in about 2 weeks and tadpoles are about 2 months old at metamorphosis (Wheeler and Wheeler 1966, Nussbaum et al. 1983).

Surveying: Adults are easy to survey, using their calls for identification during the breeding season in spring and early summer. During the breeding season, adults may also be seen in the water, but their small size and habit of freezing or diving when disturbed makes observation difficult; night surveys may be more productive. Egg masses are difficult to find. Tadpoles may be seen in ponds during the day and can be sampled with a dipnet.

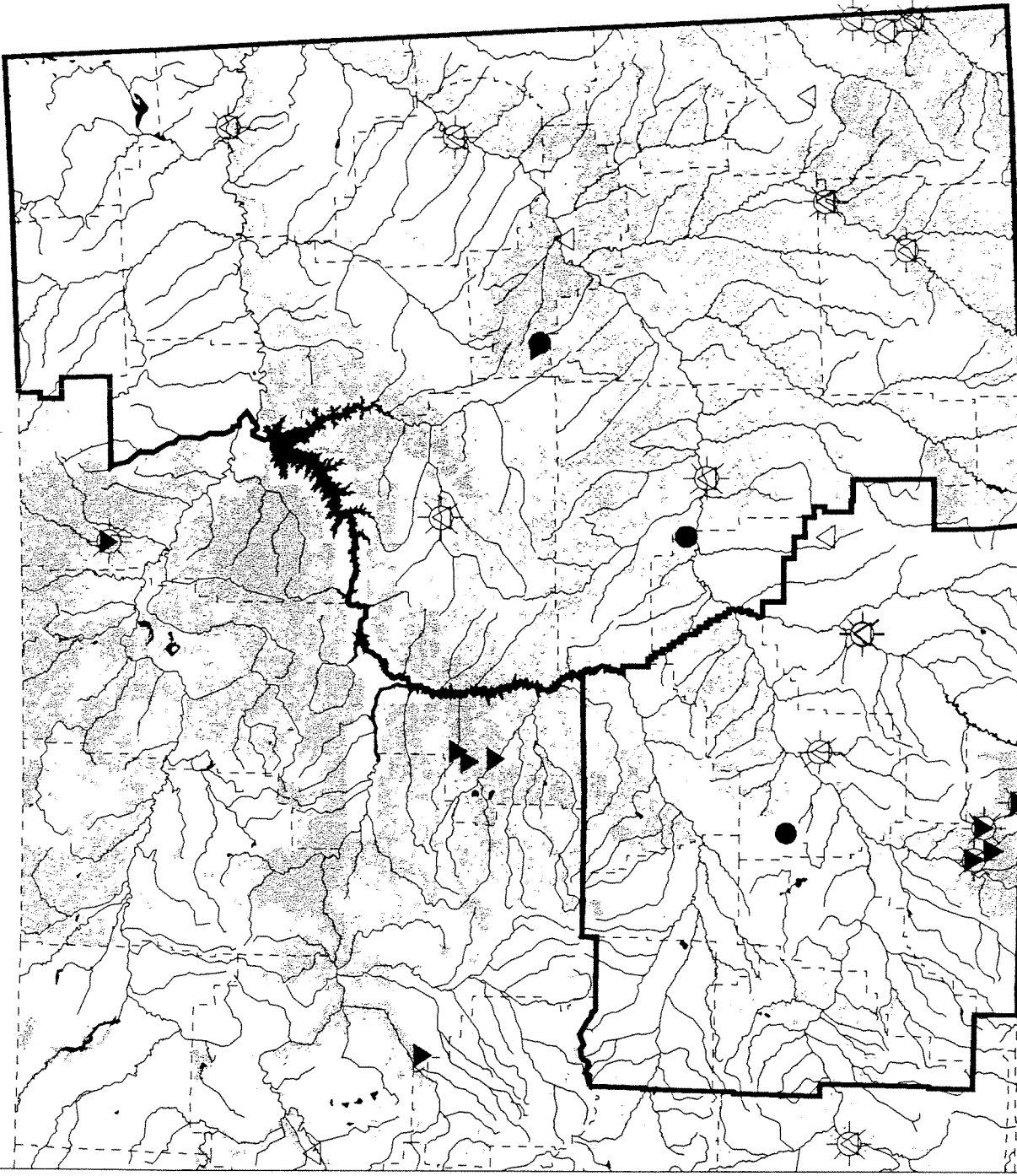
Status: Common across the prairies of eastern Montana, including throughout the Miles City District, BLM, and the most frequently encountered amphibian in eastern Montana. This species was found on 69 surveys in 12 counties in 1998 (Appendix 2), and in Carbon County on 1 survey (and 5 opportunistic encounters) in 1995 (Appendix 3b and 4).

Montana Natural Heritage Program rank: G5 S5.

Observations of
 Spea bombifrons
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Plains Spadefoot (*Spea* [= *Scaphiopus*] *bombifrons*)

Description: Adults are colored gray or brown with darker mottling on the back and a white belly. Some individuals have indistinct longitudinal streaking. The pupils of the Plains Spadefoot are vertically elliptical and there is a high, hard lump between the eyes. Its skin is less warty than true toads. The adult has a single tubercle on the hind feet and has a body length of less than 2.5".

Eggs and Tadpoles: Oval egg masses of 10-250 eggs are attached to underwater plants or debris. Tadpoles are mottled sooty and olive-yellow above and paler below with gold metallic flecking over all; iris is gold. Older tadpoles, from the two-legged stage on, show a small black tubercle on the hind feet.

Similar species: Other Montana frogs and toads have round or horizontally elliptical pupils.

Habitat and Habits: Adults are found in grassland and sagebrush areas, particularly in areas with sandy or loose soil (Wheeler and Wheeler 1966, Hammerson 1982a, Baxter and Stone 1985). Except during breeding, they are seldom found in the water. They are primarily nocturnal and emerge from their burrows only following heavy rains. They breed in shallow temporary pools usually following heavy spring or summer rains (Hammerson 1982a). Males call loudly, with groups being heard for up to a mile. Eggs hatch after 2-3 days and tadpoles transform in 6-10 weeks (Wheeler and Wheeler 1966, Hammerson 1982a). In 1998, 10+ adults were heard calling at one site (Miles Creek, Custer County) during a rainy night on 30 May (Appendix 2). In 1995, tadpoles at several stages of development (legless to 4-legged metamorphs) were found on 3 surveys between 29 June and 1 July in Carbon County (Appendix 3a and 3b).

Surveying: Adults may be easily found by using their calls for identification when breeding at night or by "road hunting" on warm, rainy nights. Calling normally takes place only when the temperature is $>50^{\circ}$ F (Hammerson 1982a). Tadpoles are seen in ponds during the day and can be sampled with a dipnet. Surveying is complicated by the long time periods which this species spends underground, especially during droughts.

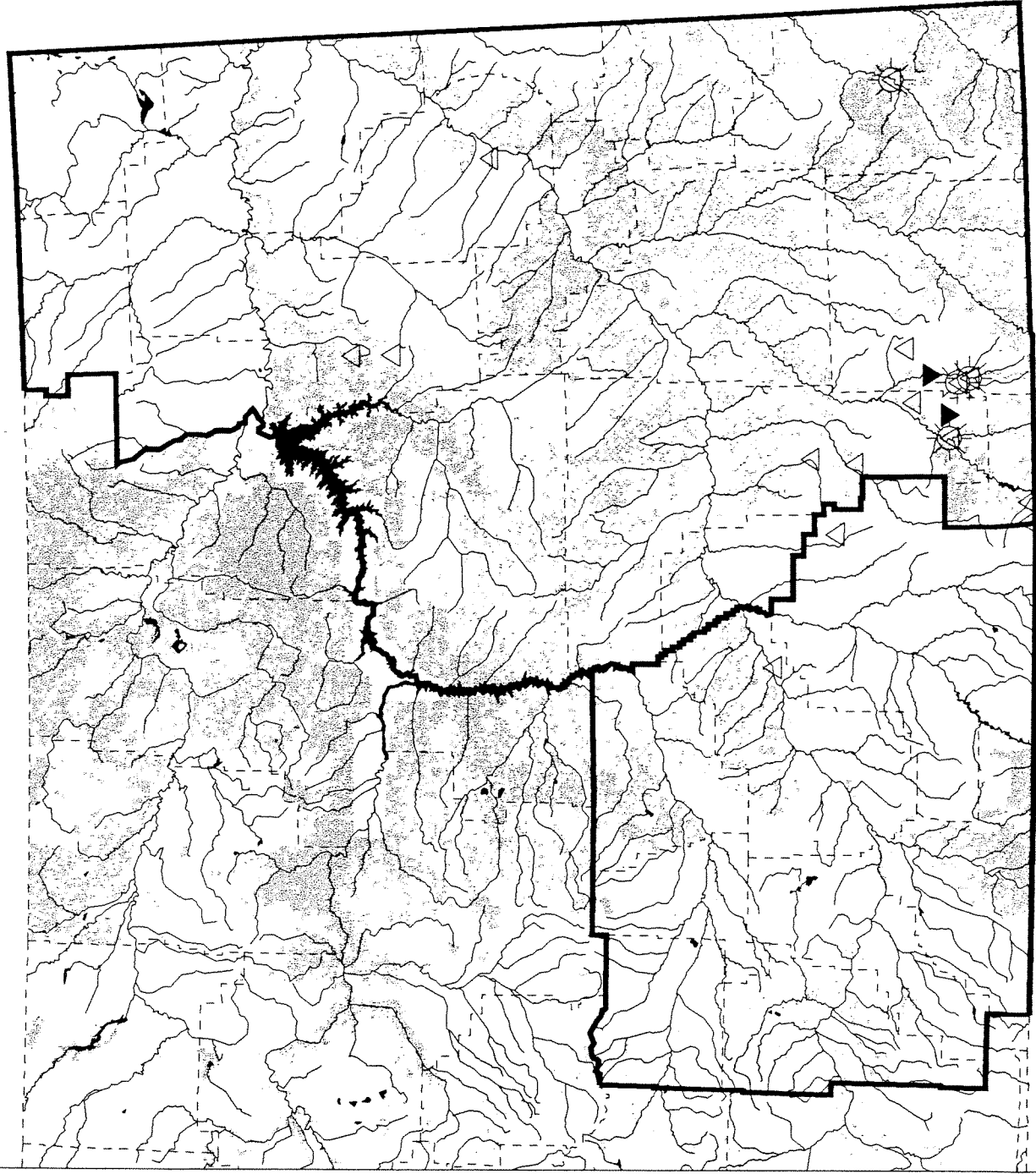
Status: The Plains Spadefoot was found at a single location in Custer County during our 1998 surveys (Appendix 2), and breeding was documented at 3 sites in 1995 in Carbon County (Appendix 3b). There were two additional reports from 1998 (in Treasure and Yellowstone counties). Despite few reports, spadefoots have been reported over the years from throughout the Miles City District, BLM. It is apparently locally common in eastern Montana (such as southern Carbon County), but there are large gaps in the known range. It should be watched for in prairie or shrub-steppe habitat, especially following late-spring and early-summer rains. Any located should be well-documented.

Montana Natural Heritage Program rank: G5 S4?

Observations of
Chelydra serpentina
Miles City District
BLM
1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☀ Museum collections

February 10, 1999
Montana Natural Heritage Program



Bullfrog (*Rana catesbeiana*)

Description: The largest of North American frogs, adult Bullfrogs may reach 8 inches in body length. The skin is smooth. Adults are usually pale to dark green or brownish green with darker spots or blotches. There are a series of black bands across the legs. The underside is cream to yellowish with gray mottling. No dorso-lateral folds are present, however there is a prominent ridge running from the eye over the tympanum to the shoulder. Males have extensive yellow pigment on the underside, especially in the throat region, and swollen thumbs. The diameter of the tympanum is larger than the diameter of the eye in males but about the same size in females.

Eggs and Tadpoles: Egg masses are a 1-2 egg thick film of thousands of eggs and may reach several feet across. Tadpoles may reach 4.5" in total length and are olive green with numerous black spots dorsally; the belly is white to creamy with varying amounts of dark mottling.

Similar species: Other Montana Ranid frogs have dorso-lateral folds.

Habitat and Habits: Bullfrogs are rarely seen far from the water's edge and are usually in the water. They are associated with larger bodies of quiet water such as ponds, lakes or backwaters of streams, usually with extensive emergent vegetation such as cattails or reeds. They emerge in the spring only after air and water temperatures have warmed considerably and insect populations are beginning to proliferate. Breeding takes place in June when males attract females to their territory by a series of very deep, loud "brr-umps." The large egg mass tends to float on the surface when first laid, but sink into the water prior to hatching (Hammerson 1982a, Nussbaum *et al.* 1983). Tadpoles over-winter in the Pacific Northwest, transforming during their second summer (Nussbaum *et al.* 1983, Leonard *et al.* 1993). The bullfrog is a voracious feeder, eating anything smaller than itself, including ducklings, fish, mice, frogs, and small turtles. Bullfrogs have been implicated in extirpations of native frogs and turtles, and declines in waterfowl production (Hammerson 1982b, Leonard *et al.* 1993, Kiesecker and Blaustein 1998).

Surveying: Tadpoles and adults can easily be detected visually or sampled by using a dipnet; both may be found from spring through fall. Capture success of adults is enhanced by night sampling using a headlamp, as they are very wary and do not allow close approach during the day. Eggs are also easy to detect when laid in the early summer.

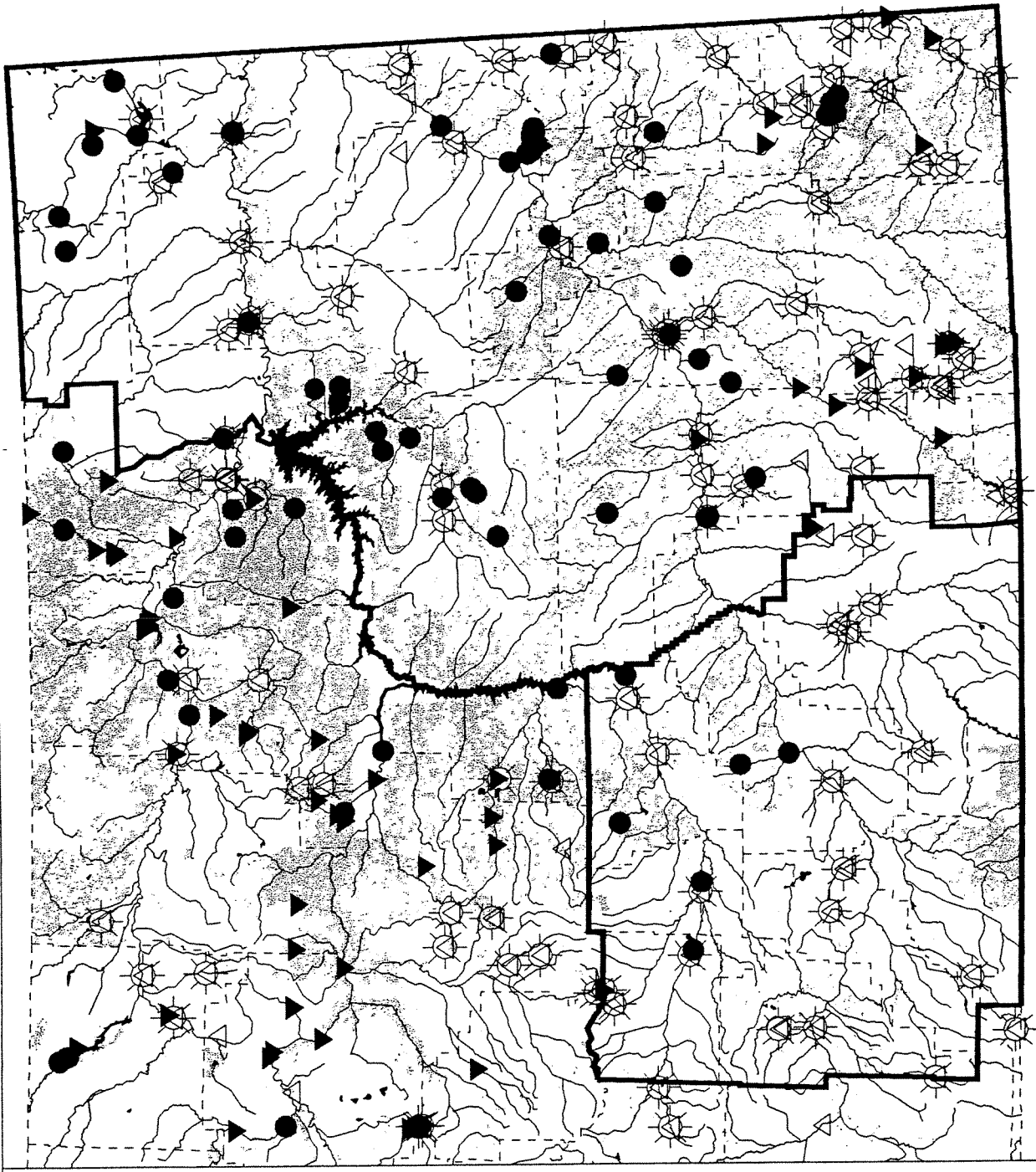
Status: Bullfrogs are native to the eastern and central U.S. and have been introduced to the western states. There are at least three older records from the 1970's in the survey area (two in Carter County, one at Fort Peck), although none as yet known from lands in BLM stewardship. However, it is possible that several unauthorized releases have occurred on private lands, based on conversations with ranchers in the region. They were introduced into western Montana prior to the mid-1960's (Black and Bragg 1968), but the date when they were first brought to eastern Montana is unknown. Bullfrogs were not recorded on our surveys. They should be watched for in ponds, lakes, sloughs, or slow streams on the Miles City District, BLM. Any located should be well documented.

Montana Natural Heritage Program rank: G5 SE4.

Observations of
Rana pipiens
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Northern Leopard Frog (*Rana pipiens*)

Description: Adults are brown or green with large, dark spots surrounded by light-colored halos on the sides and back. The dorso-lateral folds (ridges along the sides of the back) are usually lighter in color than the surrounding background. The under-side is typically white, but may be cream-colored or yellowish. The adult has a body length of 2-5". Newly transformed froglets may lack spots and are about 1" in length (Leonard *et al.* 1993).

Eggs and Tadpoles: Eggs are laid in 2-5" globular masses composed of hundreds to thousands of eggs (Hammerson 1982a, Nussbaum *et al.* 1983). The tadpoles are brown to dark brown on top with some metallic flecking, whereas the underside is often nearly transparent (Nussbaum *et al.* 1983). Total length of tadpoles may reach more than 3"; the eyes are located on top of the head.

Similar species: None, although some newly-transformed froglets may lack spots, which makes them extremely difficult to distinguish from Spotted and Wood Frogs.

Habitat and Habits: Northern Leopard Frogs are found in or near water in non-forested habitats. Vegetation is typically dense, as in a cattail marsh or dense sedge-meadow, although there is evidence that very dense vegetation may exclude frogs (Miller 1978). Breeding takes place in lakes, ponds (temporary and permanent), springs, and occasionally backwaters or beaver ponds in streams. Adults were noted from 8 April to 24 July during 1998, eggs or tadpoles were found from 10 April to 22 July. At survey sites where Northern Leopard Frogs were present in 1998 ($n = 58$), eggs or tadpoles were detected on 1 of 15 April surveys, 7 of 17 May surveys, 9 of 13 June surveys, and 1 of 13 July surveys ($G = 18.366$, $df = 3$, $P < 0.001$), indicating a peak in breeding during May and June. In Colorado, eggs hatch in 4-15 days and tadpoles take 8-15 weeks to metamorphose, depending on water temperature (Hammerson 1982a).

Surveying: Adults, tadpoles, and eggs are easily seen in and along the water during the day, and can be sampled with a dipnet. Adults may also be captured by hand. At very low densities adults may be difficult to find and may be detected using a call recorder. Tadpoles are difficult to tell from those of the Spotted Frog in areas where the two species overlap, but this is not likely to occur on BLM lands in eastern Montana.

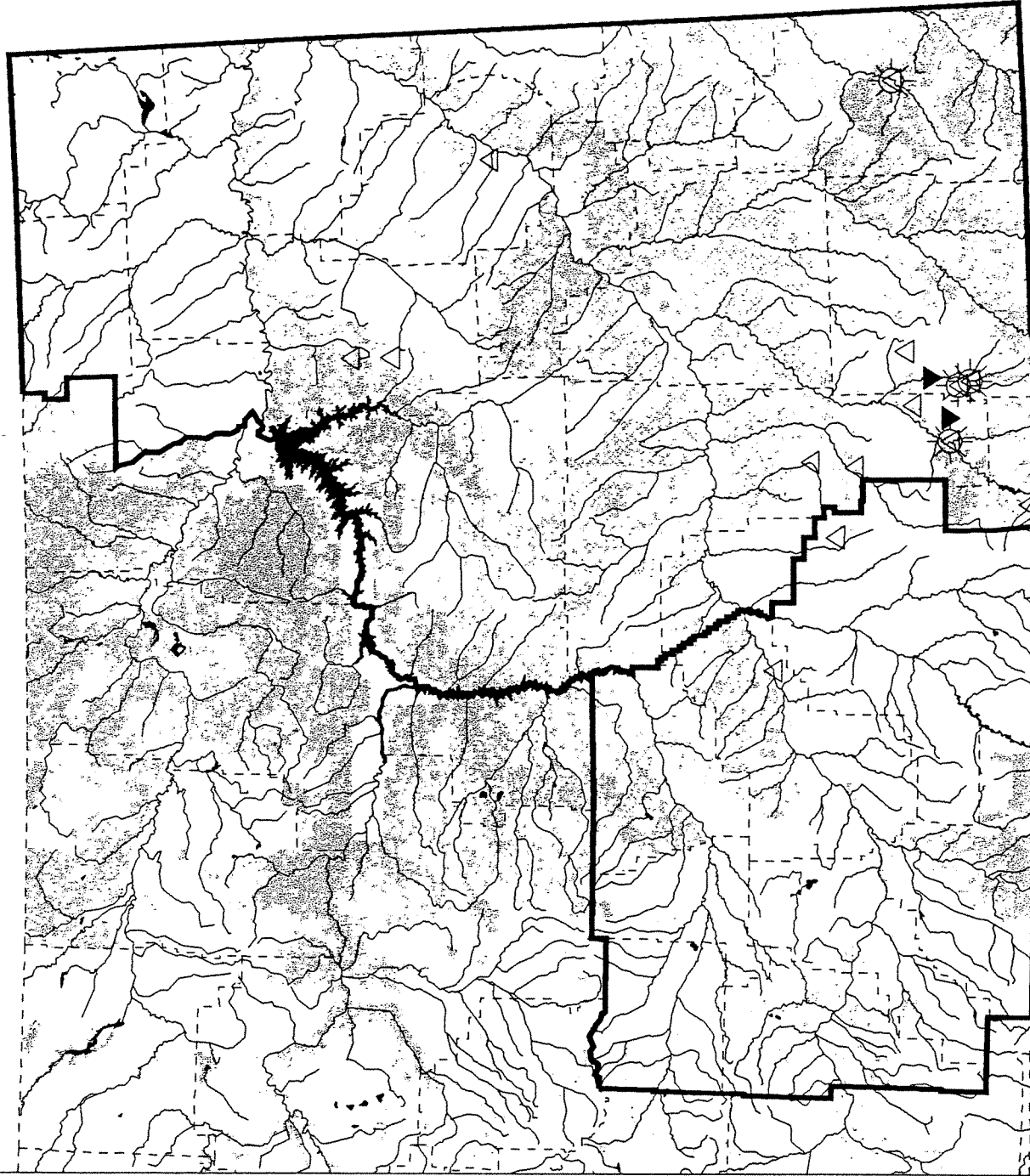
Status: Historically, the Northern Leopard Frog was widespread in Montana but it now appears to be extinct throughout much of the western part of the state (Werner and Reichel 1994, Werner *et al.* 1998). Its status is not clear in central Montana, and it appears that only localized populations are present on the western edge of the plains (Reichel 1995a). It is still relatively abundant and widespread across much of eastern Montana. Northern Leopard Frogs were found at 5 of 6 historical sites surveyed within the Miles City District, BLM in 1998 (1 in Custer County, 2 in Roosevelt County, 3 in Rosebud County). In 1998, leopard frogs were found on 58 surveys in 13 counties (Appendix 2) and during opportunistic encounters in 4 additional counties (Appendix 4). Breeding was documented at 15 sites. It is fairly common in southeastern Montana and northwestern South Dakota on the Ashland and Sioux districts, Custer National Forest (Reichel 1995b, Hendricks and Reichel 1996, pers. obs.). Visher (1914) called it abundant in adjacent Harding County, South Dakota. Given its dramatic declines in western Montana and other states and provinces, however, breeding sites should be documented and a long-term monitoring program begun.

Montana Natural Heritage Program rank: G4 S3S4. Species of Special Concern.

Observations of
Chelydra serpentina
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Common Snapping Turtle (*Chelydra serpentina*)

Description: The Common Snapping Turtle appears too large for its shell. The upper shell is olive-gray, or brown to black with the posterior edge very serrated; it has three low keels with protrusions positioned on each scute (a scale-like plate on the shell). The much-reduced lower shell is cream-colored. A long, keeled tail and warty tubercles on the head and neck are distinguishing characteristics. Males average about 10-20% larger than females, and have the anal opening posterior to the rim of the upper shell (Ernst *et al.* 1994). Most adults range from 13-30 pounds in Montana; the largest known Montana specimen was a 47-pound male (Reichel and Flath 1995).

Eggs and Young: The spherical, white, tough-shelled eggs are about 23-33 mm in diameter (Ernst *et al.* 1994). They typically number 20-40 per clutch (Ernst *et al.* 1994). Coloration of young turtles is similar to adults and the upper shell is 24-31 mm long.

Similar Species: None.

Habits and Habitat: Snapping turtles occur in stock ponds, reservoirs, sloughs and backwaters, rivers, irrigation ditches, and slower-moving streams, such as Otter Creek in Powder River County (Hendricks and Reichel 1996). They prefer waters with a soft mud or sand bottom, and much aquatic vegetation or debris (Ernst *et al.* 1994). They do occasionally move overland, but are found doing so less frequently than Painted Turtles. Food is mostly animal matter. In the north it is most active in the morning and evening (Ernst *et al.* 1994). Adult females first breed at 12-19 years of age in Michigan and Ontario (Ernst *et al.* 1994). Eggs are laid in nests excavated in sandy or gravelly areas or muskrat houses in late spring or early summer. Sex is determined by the temperature of incubation (Ernst *et al.* 1994). Hibernation is in soft bottoms, under cut-banks, or among submerged roots. Snapping Turtles have a reputation for an evil temper, and are quick to bite. They can be handled safely if carried by the tail with the upper shell *away* from the captor.

Surveying: Although various turtle traps can be used for surveys, visual identification is suitable for presence/absence studies since the three turtle species in Montana are easily distinguished. Surveys should be done on sunny days with a pair of binoculars. During cold or cloudy weather, turtles tend to remain underwater for long periods and can be missed on a walk-through survey.

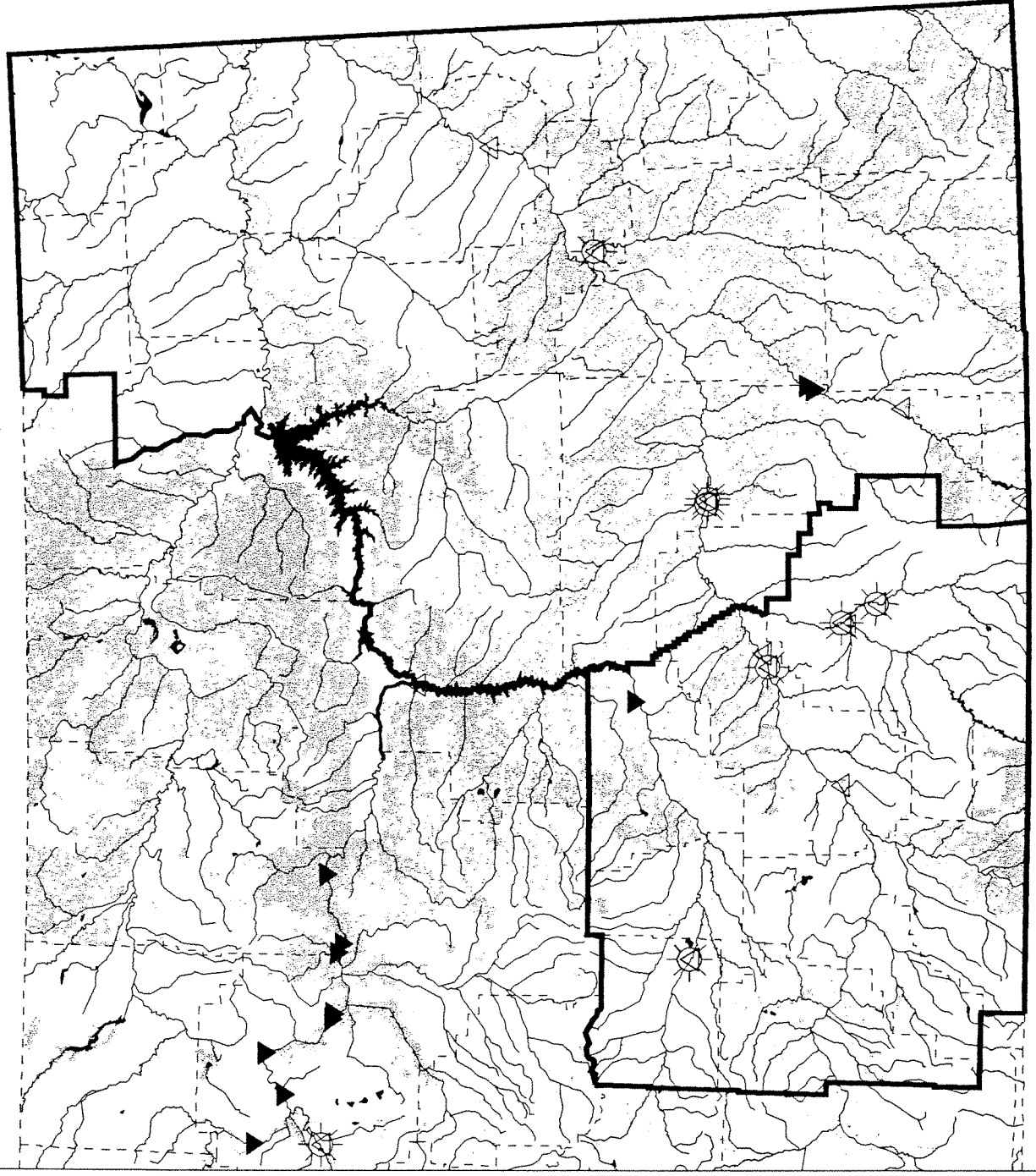
Status and Distribution: Common Snapping Turtles occur in the Yellowstone River downstream from Billings, the Missouri River downstream from Ft. Benton, and probably all tributaries (such as the Tongue River) with suitable water. There are no records downstream from Ft. Peck Dam. They also occur in water bodies that can be reached by a short trek across land. Eastern Montana records are few, widely scattered, but mostly concentrated in the coal country of Rosebud and Powder River counties. Some snapping turtles are caught with fishing tackle. Concentrated unregulated harvest could be detrimental to local populations. Although not encountered in 1998, it is probably more abundant and widespread in eastern Montana than records indicate. For example, there are no records in the MTNHP database for Wibaux County, but a local farmer said they are resident in Beaver Creek south of Wibaux (pers. comm. 1998). It should be watched for particularly in ponds, streams, and rivers; any animals located on BLM lands should be documented.

Montana Natural Heritage Program rank: G5 S3. Species of Special Concern, BLM Special Status Species.

Observations of
Trionyx spiniferus
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Spiny Softshell (*Trionyx spiniferus*) (= *Apalone spinifera*)

Description: Spiny Softshells have flexible, leathery shells. The carapace is olive-gray, marked with dark spots. The plastron is white or light cream-colored. Female carapace length is up to 18 inches or more, whereas males are typically 6-8 inches. The nostrils are terminal, allowing this turtle to remain entirely beneath the surface and take air through its "snorkel."

Eggs and Young: The nest is a flask-shaped excavation containing 4-39 (typically 12-18) hard-shelled, spherical, white eggs. The individual eggs range in size from 24-32 mm in diameter and average about 28 mm. Hatchlings resemble adults and are 30-40 mm in shell length (Ernst *et al.* 1994).

Similar Species: None.

Habits and Habitat: Spiny Softshells are active during the day. This highly aquatic turtle is found in rivers or their connecting backwaters with muddy or sandy bottoms. Unlike other Montana turtles, they do not move overland from one water body to another. Mud and sand banks and bars are used for both basking and nesting. Hibernation takes place beneath the water, usually beneath 5-10 cm of bottom substrate (Ernst *et al.* 1994). The retracted head and neck combines with the profile of the shell to produce a wedge shape, which allows this turtle to escape by literally diving into the bottom mud. If necessary, additional strokes of the legs will completely bury it in the substrate, hidden from view. Food items include fish, crayfish, frogs, toads, aquatic insects, and carrion. Spiny Soft-shells have a surprisingly long, agile neck and can inflict a painful bite. They can be safely handled by grasping the shell on each side between the front and rear legs with the head pointing *away* from the captor.

Surveying: various turtle traps can be used for surveys, although visual identification is suitable since the three turtle species in Montana are easily distinguished. A pair of binoculars is helpful and surveys should be done on warm sunny days; basking seldom takes place before 10:00 a.m. (Ernst *et al.* 1994). During cold or cloudy weather, turtles tend to remain underwater for long periods and can be missed on a walk-through survey. Care should be taken to watch for the snorkel-like nostrils projecting just above the surface of the water.

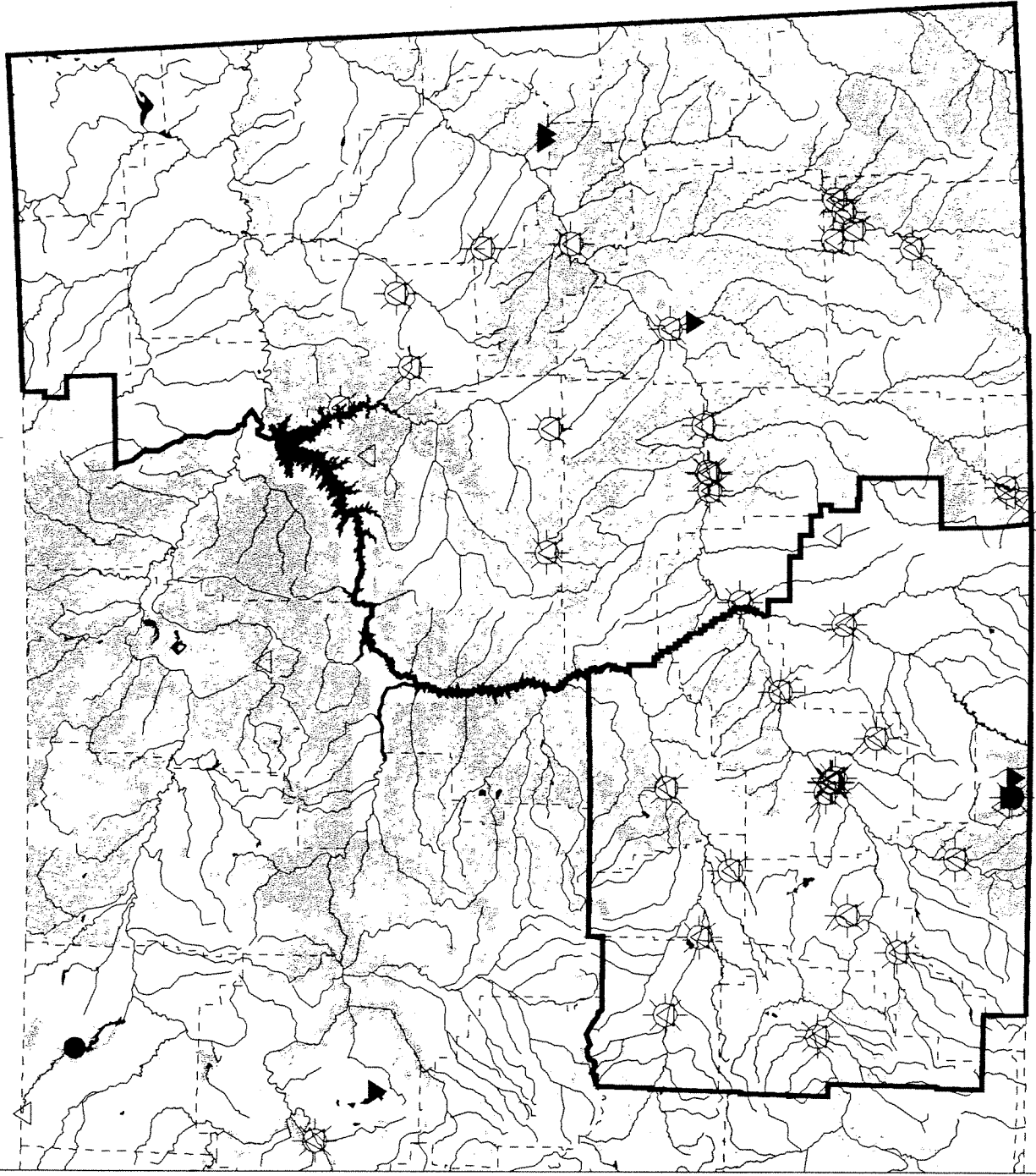
Status and Distribution: Status of this species in eastern Montana is uncertain, as it is reported infrequently. It was not encountered during the 1998 surveys. It may be more common and widespread than current records indicate. For example, this species has been seen 3 consecutive years (1995-1997) on the Tongue River in Rosebud and Custer counties near Brandenburg. It is found mainly in the Yellowstone and Missouri Rivers and their major tributaries (such as the Tongue and Musselshell rivers). The Yellowstone and Missouri rivers populations may be separated from each other, and are believed to be disjunct from the population in South Dakota (Ernst *et al.* 1994); they have not been reported from North Dakota (Wheeler and Wheeler 1966). The Missouri River population is known from the tail of Fort Peck Reservoir upstream to the first dam, and from most of the Musselshell River. They have not been reported from Fort Peck Reservoir or in the Missouri River downstream from Fort Peck Dam. Any located on BLM lands should be documented and reported.

Montana Natural Heritage Program rank: G5 S3. Species of Special Concern, BLM Special Status Species.

Observations of
Phrynosoma hernandesi
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Short-horned Lizard (*Phrynosoma hernandesi* [= *douglasi*])

Description: The Short-horned lizard has a broad, somewhat flattened body and relatively short limbs and tail. It is generally tan to gray with dark and light spots and blotches; the belly is white. There is a distinctive line of pointed scales along each side, and the head has short, blunt "horns" pointing backward. Adult lizards range from 1.7 - 5.5" in length.

Young: Young are live-born and resemble small adults.

Similar species: None. Only one other lizard species in the region.

Habitat and Habits: Short-horned lizards are found in a variety of habitats, including dry open forests, grasslands, and sagebrush; the soil is usually loose or sandy. In firmer soil situations, it may use the burrows of other animals. It is active during the day, typically with the peak of activity in mid-late morning. A Short-horned Lizard may squirt blood from its eyes when disturbed. Little is known about reproduction in this part of the range; young are born live in late summer (Baxter and Stone 1985). A small juvenile was encountered on 11 September 1995 in Carbon County (Appendix 4). Ants are the primary food of the species.

Surveying: They may be surveyed by slowly walking through appropriate habitat and watching carefully for them, looking especially near ant mounds. This technique has low success with Short-horned Lizards however. As with many lizards and snakes, they are easily missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in pitfall or funnel traps in combination with drift fences. A juvenile was captured inadvertently in 1995 in a pitfall trap set for shrews (pers. observ.).

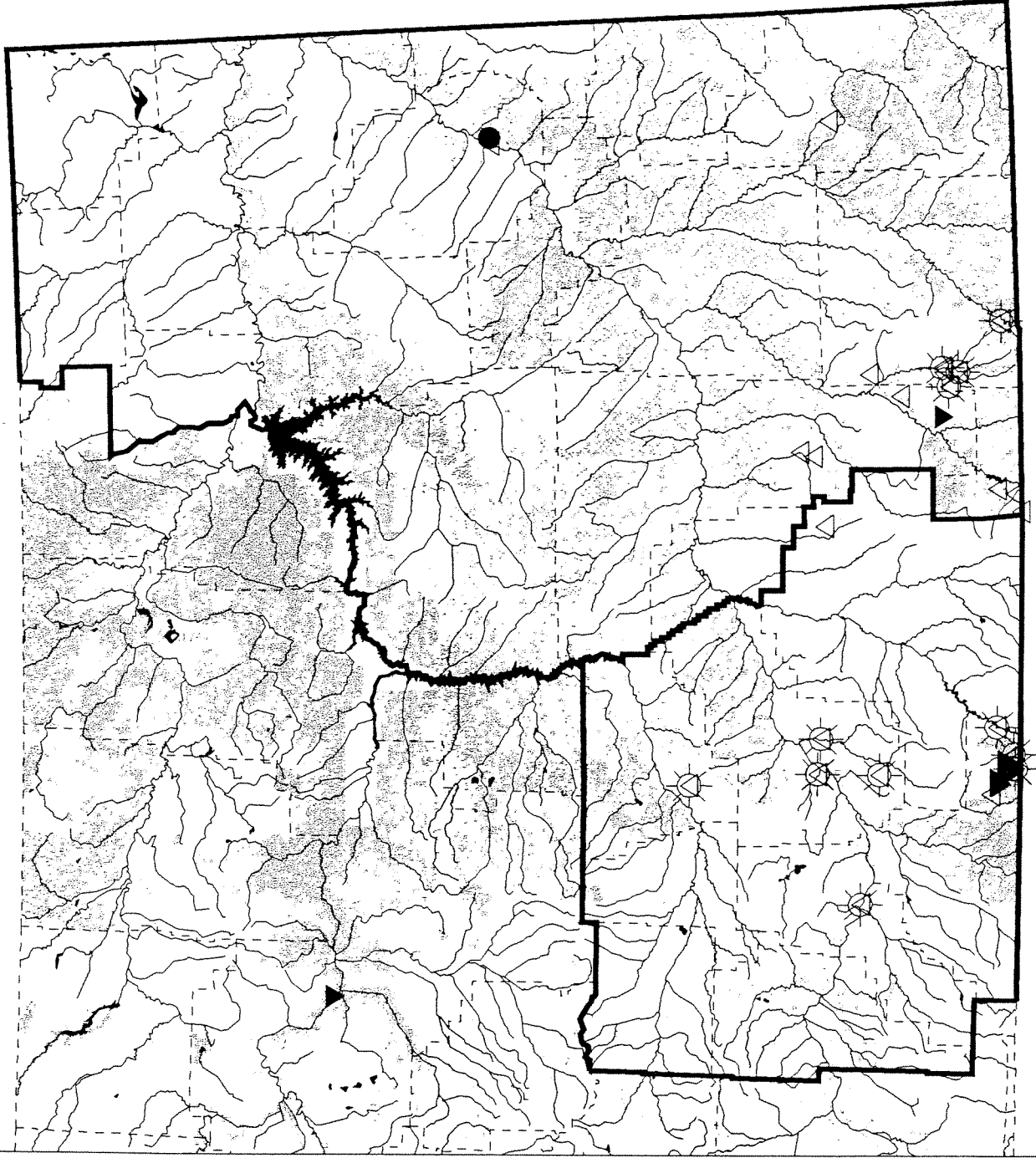
Status: The Short-horned Lizard was a former U.S. Fish and Wildlife Service Category 2 Candidate species (U.S. Fish and Wildlife Service 1994). It is widely distributed, but apparently localized in eastern Montana. Although not encountered during the 1998 surveys, the species is fairly common on the south side of the Pryor Mountains in Carbon County, and there was one 1998 record reported from that area. There are several other areas in southeastern Montana where records are clustered. Although there are no records for Montana counties bordering the Dakotas, there are several records from adjacent counties in North Dakota (Wheeler and Wheeler 1966), and it was reported as common in Harding County, South Dakota (Visher 1914), where it is still considered locally common (Stukel and Backland 1997). This species may be vulnerable to collecting for the pet trade and agricultural conversion of native habitats. It should be watched for in open pine, prairie, or shrub-steppe habitat with loose or sandy soils; all sightings should be documented.

Montana Natural Heritage Program rank: G5 S4.

Observations of
Sceloporus graciosus
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Short-horned Lizard (*Phrynosoma hernandesi* [= *douglasi*])

Description: The Short-horned lizard has a broad, somewhat flattened body and relatively short limbs and tail. It is generally tan to gray with dark and light spots and blotches; the belly is white. There is a distinctive line of pointed scales along each side, and the head has short, blunt "horns" pointing backward. Adult lizards range from 1.7 - 5.5" in length.

Young: Young are live-born and resemble small adults.

Similar species: None. Only one other lizard species in the region.

Habitat and Habits: Short-horned lizards are found in a variety of habitats, including dry open forests, grasslands, and sagebrush; the soil is usually loose or sandy. In firmer soil situations, it may use the burrows of other animals. It is active during the day, typically with the peak of activity in mid-late morning. A Short-horned Lizard may squirt blood from its eyes when disturbed. Little is known about reproduction in this part of the range; young are born live in late summer (Baxter and Stone 1985). A small juvenile was encountered on 11 September 1995 in Carbon County (Appendix 4). Ants are the primary food of the species.

Surveying: They may be surveyed by slowly walking through appropriate habitat and watching carefully for them, looking especially near ant mounds. This technique has low success with Short-horned Lizards however. As with many lizards and snakes, they are easily missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in pitfall or funnel traps in combination with drift fences. A juvenile was captured inadvertently in 1995 in a pitfall trap set for shrews (pers. observ.).

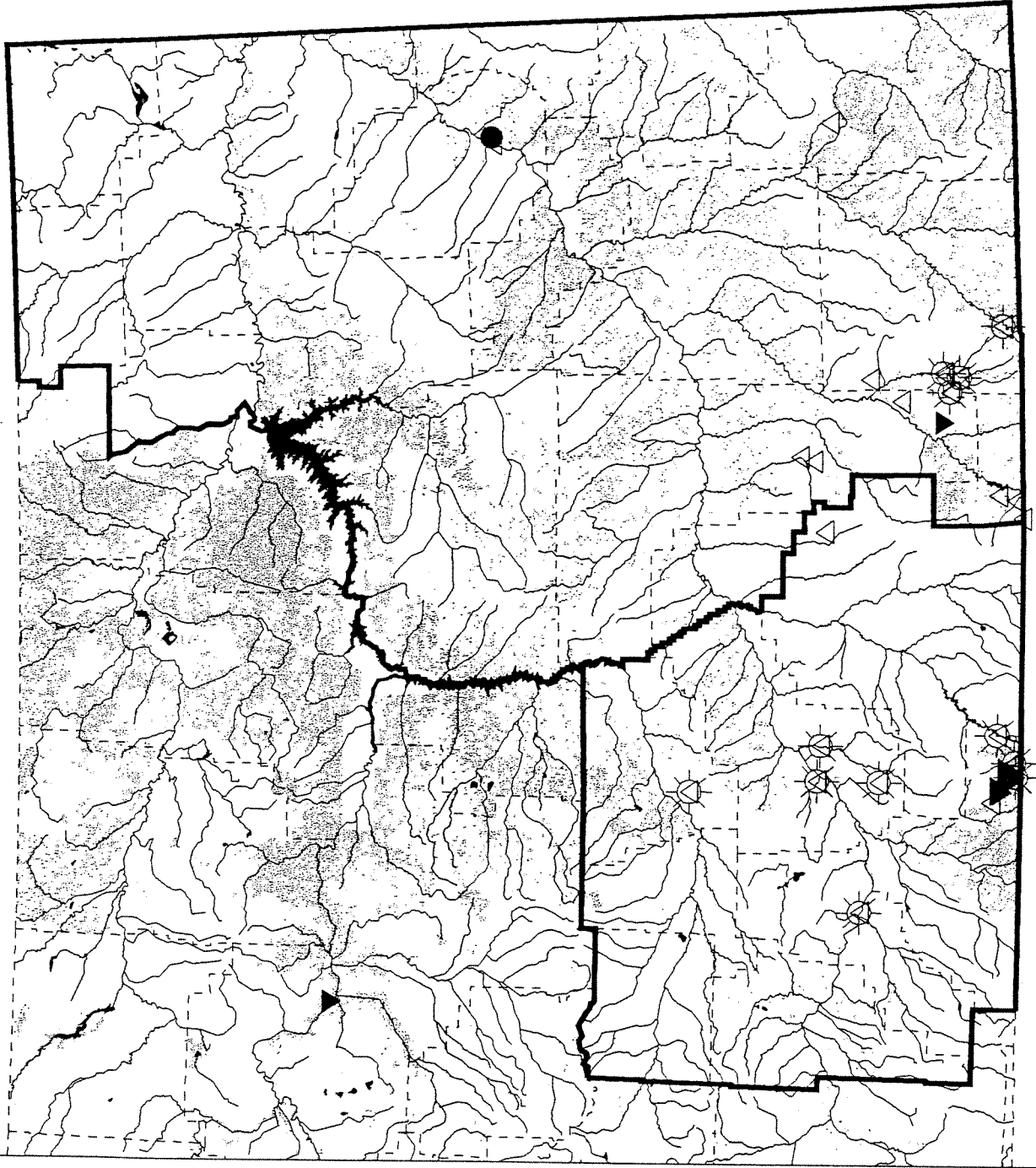
Status: The Short-horned Lizard was a former U.S. Fish and Wildlife Service Category 2 Candidate species (U.S. Fish and Wildlife Service 1994). It is widely distributed, but apparently localized in eastern Montana. Although not encountered during the 1998 surveys, the species is fairly common on the south side of the Pryor Mountains in Carbon County, and there was one 1998 record reported from that area. There are several other areas in southeastern Montana where records are clustered. Although there are no records for Montana counties bordering the Dakotas, there are several records from adjacent counties in North Dakota (Wheeler and Wheeler 1966), and it was reported as common in Harding County, South Dakota (Visser 1914), where it is still considered locally common (Stukel and Backland 1997). This species may be vulnerable to collecting for the pet trade and agricultural conversion of native habitats. It should be watched for in open pine, prairie, or shrub-steppe habitat with loose or sandy soils; all sightings should be documented.

Montana Natural Heritage Program rank: G5 S4.

Observations of
Sceloporus graciosus
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Sagebrush Lizard (*Sceloporus graciosus*)

Description: The Sagebrush Lizard is small (1.5 - 2.5" body length) and narrow-bodied. The color pattern in adults consists of alternating dark and light stripes running down the back. The colors are typically brown, gray, and cream. Males have mottled blue throat patches and bright blue belly patches, while females are white or yellow below (Censky 1986). The body and tail scales appear somewhat spiny.

Eggs and young: There are 2-7 tough, white leathery eggs in a clutch, averaging about 7.5 X 12 mm (Nussbaum *et al.* 1983). Body length of hatchlings is about 25 mm, and coloration is similar to adults.

Similar species: None in the Miles City District, BLM region. The Short-horned Lizard has a wide body.

Habitat and Habits: Sagebrush Lizards are found primarily in sagebrush areas, but also occur in open forests and brush lands; they are found in both areas of fine soils and rocky outcrops (Hammerson 1982a, Baxter and Stone 1985, Nussbaum *et al.* 1983). In the Yellowstone area, they are found near thermal features (Mueller 1969). They are active during the day, with peaks of activity around 10 a.m. and 4:30-5:30 p.m. (Hammerson 1982a). Females lay eggs in loose or sandy soil in early summer; the young hatch in late summer. Small juveniles were captured in Carbon County on 25 September 1995 (Appendix 4). They feed primarily on insects and other arthropods.

Surveying: They may be surveyed for by slowly walking through appropriate habitat on warm, sunny days and carefully watching for them; this technique is very effective for the Sagebrush Lizard. However, as with many lizards and snakes, they may easily be missed if conditions are not correct. Carefully documented incidental observations provide excellent clues to their distribution. They may be captured with a pole and noose or may be also taken in funnel traps with drift fences. Adults and juveniles have been captured inadvertently in pitfall can traps set for shrews (pers. observ.). Mark-recapture methods offer the best opportunity for determining population status.

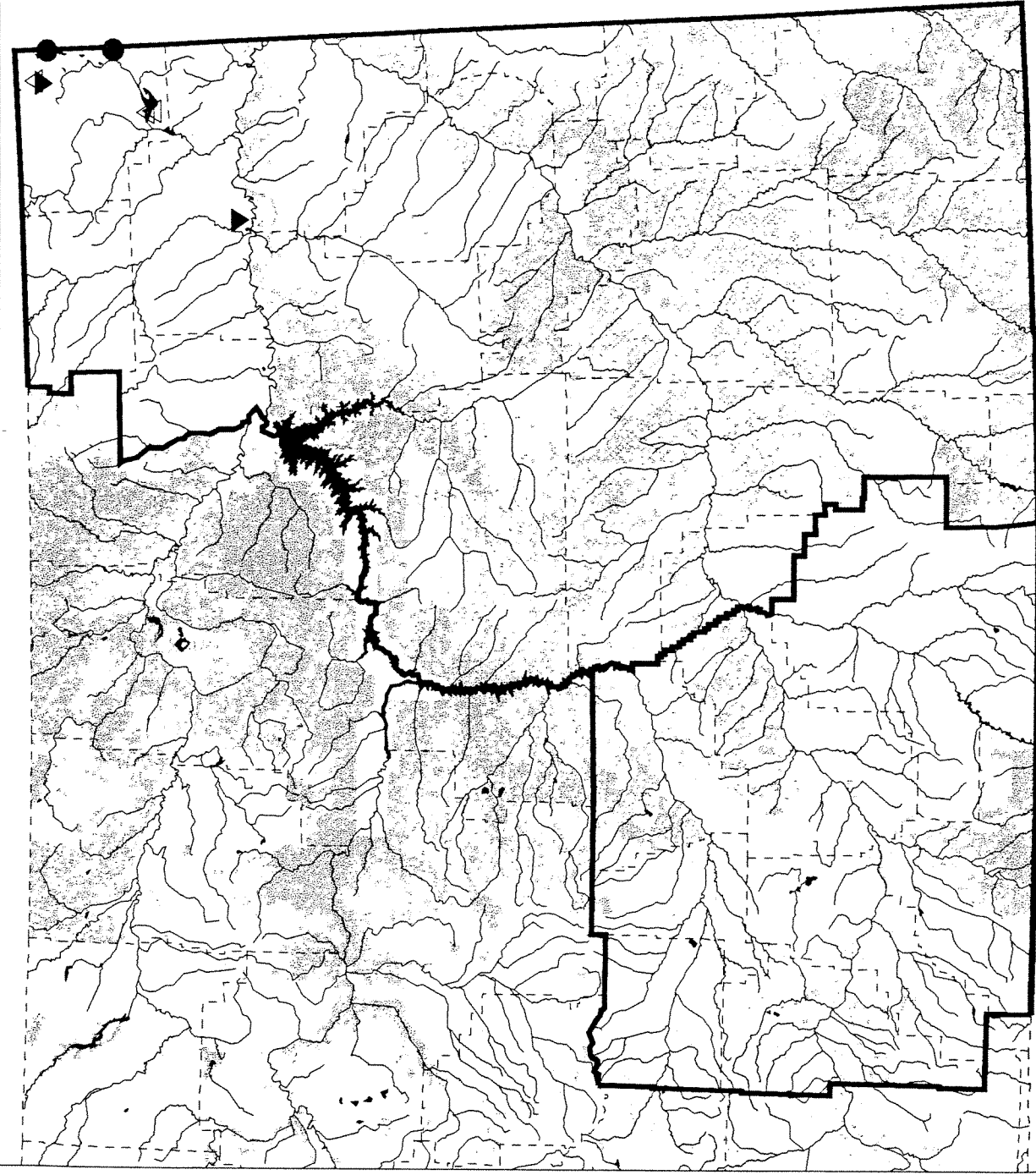
Status: The Sagebrush Lizard was a former U.S. Fish and Wildlife Service Category 2 Candidate species (USFWS 1994). It is apparently locally common in southern Montana, from Yellowstone Park eastward to at least Chalk Butte in Carter County. The species was common in Carbon County on the south side of the Pryor Mountains in 1995 (Appendix 4). This species was not encountered during the 1998 surveys, but there was one 1998 record from Dawson County near Glendive. They are known from the western border of South Dakota south of Harding County (C. R. Peterson pers. comm., Stukel and Backlund 1997), and two disjunct populations are known from the western edge of North Dakota (Censky 1986). This species should be watched for, and any animals located should be documented.

Montana Natural Heritage Program rank: G5 S4.

Observations of
Liochlorophis vernalis
Miles City District
BLM
1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
Montana Natural Heritage Program



Smooth Green Snake (*Liochlorophis* [= *Opheodrys*] *vernalis*)

Description: Smooth Green Snakes are small (about 16-20 inches total length) and slender.

Dorsal color is uniform grass green, the belly is white. Scales on the dorsum are smooth, each nostril is centered in a single scale, and the anal scale is divided.

Similar species: The Racer can be green on the dorsum, but not as bright green as the Smooth Green Snake. Racers in the size range of this species display a juvenile pattern of dark patches that is similar to adult Gopher Snakes and not at all bright green. The nostril contained within a single scale distinguishes this species from all other Montana snakes.

Habitat and Habits: Smooth Green Snakes are usually associated with dense herbaceous cover in riparian sites, either in woodlands or more open country, but they occasionally wander into drier habitats adjacent to riparian areas (Wheeler and Wheeler 1966, Hammerson 1982a). When inactive or denning, they often occur under stones and boards, underground, or in rotting logs. Terrestrial insects and spiders are the primary foods, but it sometimes feeds on aquatic invertebrates. Lays clutches of 4-8 eggs rather than giving live birth. Eggs may hatch in August (Baxter and Stone 1985), but nothing is known of reproduction in Montana. A juvenile (24 cm total length) was found on 7 July 1998, but may not have been a young-of-the-year.

Surveying: Walk-through surveys, especially through riparian habitats on relatively warm days, are probably among the best methods for detecting this species. Turning over boards, logs and rocks might reveal inactive individuals (Baxter and Stone 1985). Funnel traps used in conjunction with drift fences may be useful, but most sightings are likely to be opportunistic.

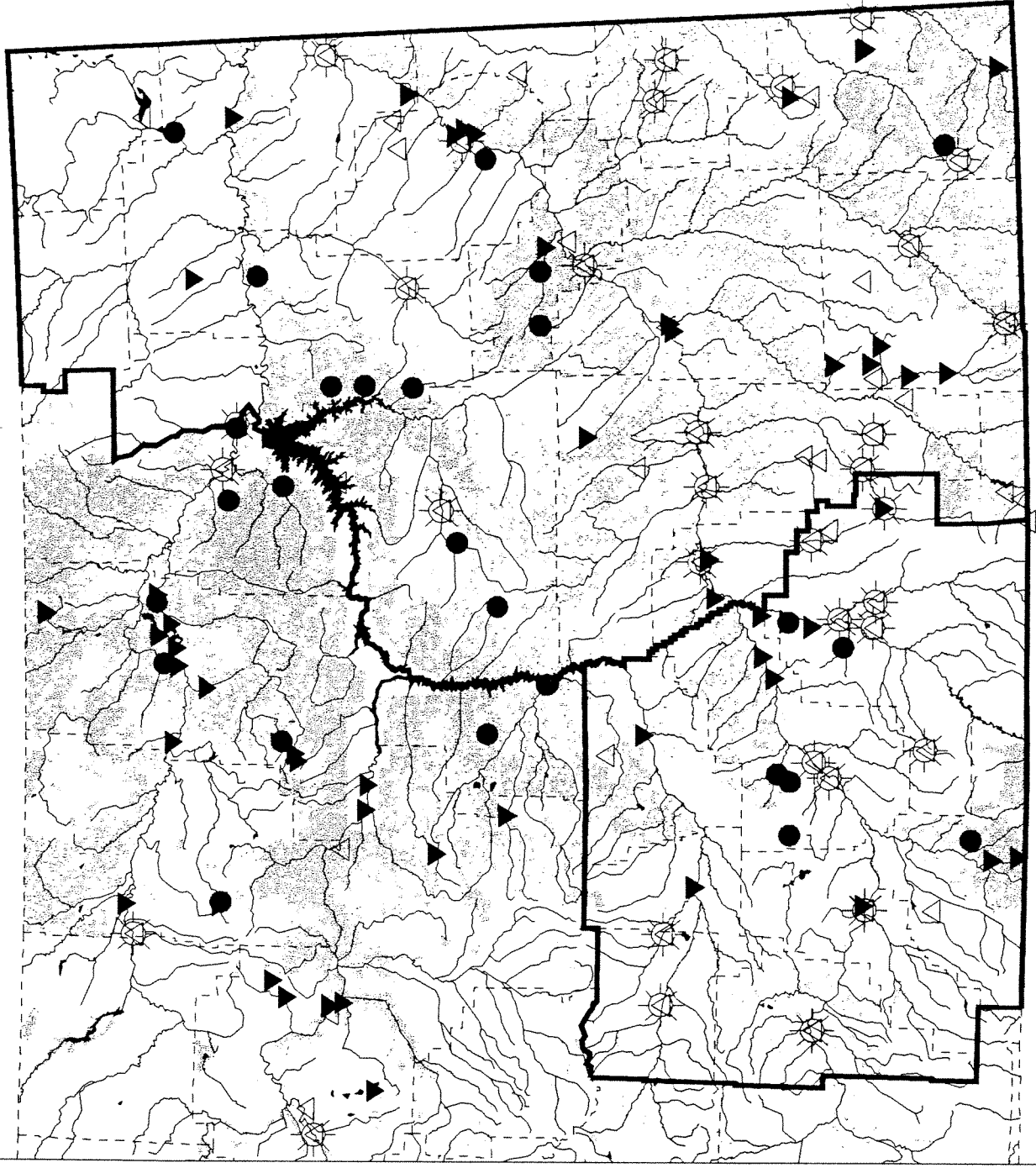
Status: The Smooth Green Snake is reported infrequently in Montana, perhaps because it is easily overlooked. This species occurs regularly at Medicine Lake National Wildlife Refuge in Sheridan County (see Black and Bragg 1968), although there were no confirmed records (photographs or specimens) for Montana prior to 1998. Two specimens collected in Sheridan County (Appendix 4) on 7 July and 28 August represent the first verified records for the state. Currently, this species is reported from Sheridan and Roosevelt counties, but it is likely that additional field work will reveal its presence in adjacent Daniels County, and perhaps on the south side of the Missouri River in Richland and McCone counties (Hart et al. 1998).

Montana Natural Heritage Program rank: G5 S2S3. Species of Special Concern.

Observations of
Pituophis catenifer
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Gopher Snake (*Pituophis catenifer* [=melanoleucus])

Description: Montana's largest snake, the adult Gopher Snake (also called Bullsnake or Pine Snake) can reach a total length of 7 feet, but most specimens seen in western Montana range from 3-5 feet. It is readily recognized by a series of large black to brown blotches which run down the back, and another series along the sides. The blotches, which are set on a yellow background, become more widely spaced and darker towards the tail. The dorsal scales are keeled. There is usually a black band on the head located in front of and extending below the eyes. The ventral coloration is yellow to white, often spotted with black, and the anal plate is undivided.

Eggs and Young: Gopher Snakes lay between 2-24 eggs during the summer months (Hammerson 1982a), and the young resemble the adults in coloration.

Similar species: Young Racers have a black border on dark blotches and the scales are not keeled. Young Western Hognose Snakes have an upturned nose. Western Rattlesnakes have a rattle on their tail and triangular-shaped heads.

Habitat and Habits: Gopher Snakes are associated with dry, arid habitats, including grassland, shrub-steppe, and open pine forest. They feed on rodents, rabbits, ground-dwelling birds, and to a lesser extent on frogs and toads found around stock ponds and other wetlands. They have a habit of hissing and vibrating the tail when alarmed, often sounding like rattlesnakes. They occasionally climb trees, hence the common name "Pine Snake." During the 1998 surveys, adults were encountered between 1 May and 22 July (Appendix 4).

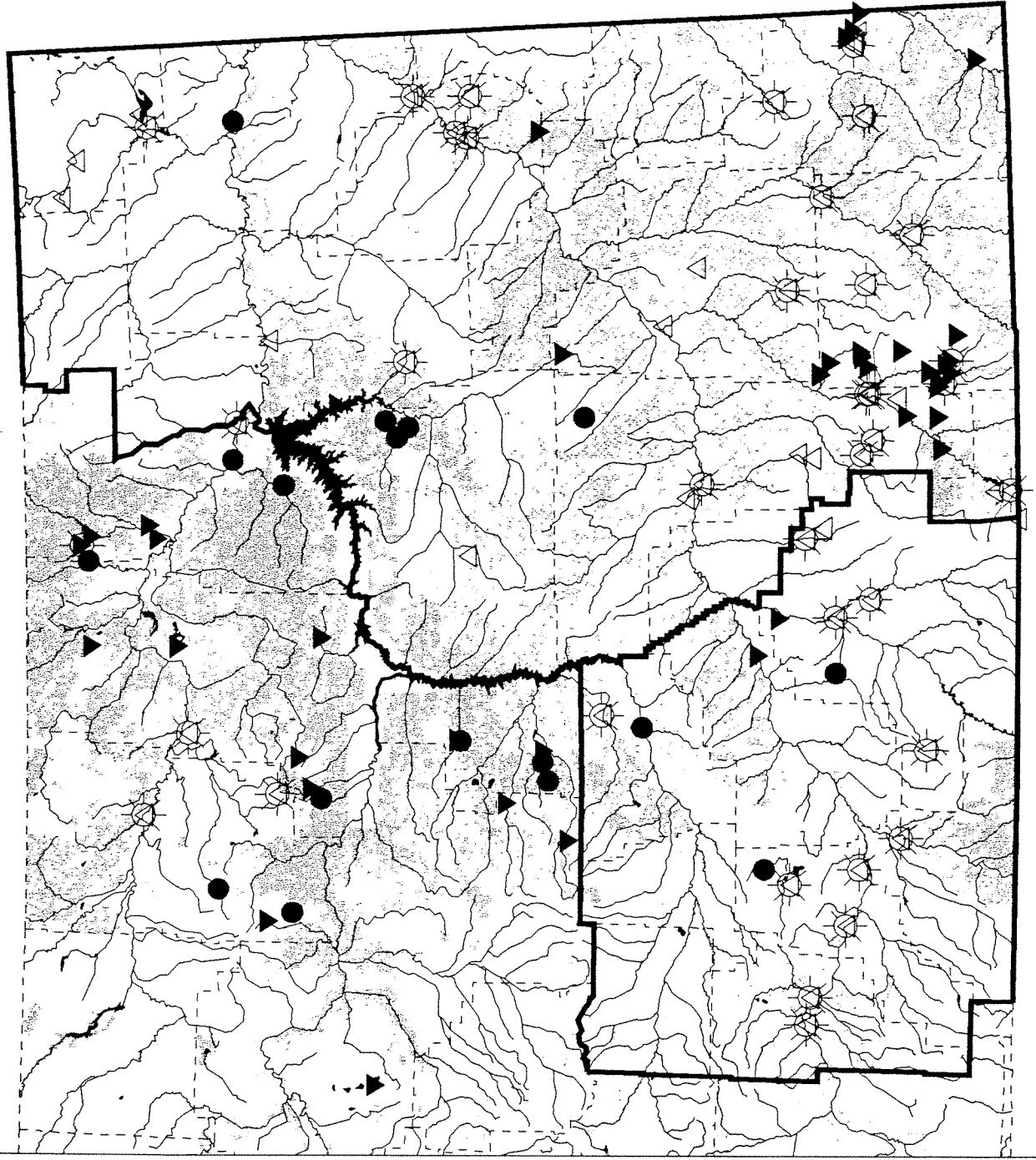
Surveying: Walk-through surveys, done on a regular basis in warm, sunny weather, probably give the best results without resorting to trapping techniques. Gopher Snakes are most easily found near dens in the spring and fall. Funnel trapping is effective and they may occasionally be found by night driving during the mid-summer. Many MTNHP records are documented road-kills. Population data can be enhanced by mark-recapture techniques.

Status: The Gopher Snake is widespread in eastern Montana, and the most frequently encountered large snake. There are records from all counties bounded by the Miles City District, BLM, except Daniels County. This species was not detected during the 1998 site surveys, but was encountered 11 times in 6 counties in 1998, and twice in Carbon County in 1995 (Appendix 4). Additional 1998 records came from Big Horn, Carbon, Dawson, and Yellowstone counties. Although this is a common species, any sightings should still be documented to fill distribution gaps. Of particular interest would be documentation of any denning sites located.

Montana Natural Heritage Program rank: G5 S5.

Observations of
Coluber constrictor
Miles City District
BLM
1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections



February 10, 1999
Montana Natural Heritage Program

Racer (*Coluber constrictor*)

Description: A slender, but moderately long snake, the Racer ranges from 20-65 inches in length.

Adult coloration is uniform across the dorsal side, but it can vary from a greenish-gray to brown or blue. The ventral side is whitish to pale yellow, the latter color extending onto the upper lip scales and nasal region. The eyes are relatively large. The scales are smooth and the nostril is bordered by two scales.

Young: Snakes (up to about 20") have a much different coloration than the adults, consisting of a series of dorsal brown blotches edged with black which run the length of the animal; a row of blotches is also found on each side of the animal extending onto the ventral side.

Similar species: Young Gopher Snakes may be distinguished by the keeled rather than smooth scales of the young Racer. Young Western Hognose Snakes have an upturned nose. Smooth Green Snakes are smaller and colored bright grass-green and whitish below; their nostrils are centered in single scales. The Rubber Boa has very small eyes and is very slow and docile.

Habitat and Habits: The Racer is associated with more open habitats either in shortgrass, shrub-steppe, or forested areas (Hammerson 1982a, Baxter and Stone 1985). It is often found near water and rocks. The Racer is an extremely fast and agile snake. A clutch of perhaps 3-7 eggs is laid in the summer (Stebbins 1985). It preys on insects and small vertebrates such as mice and frogs. Adults were documented in 1998 between 19 May and 28 June (Appendix 2).

Surveying: They may be surveyed for by slowly walking through appropriate habitat on warm, sunny days and carefully watching for them; this technique is moderately effective for the Racer. However, as with many lizards and snakes, they may easily be missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in funnel traps with drift fences. Mark-recapture methods offer the best opportunity for determining population status.

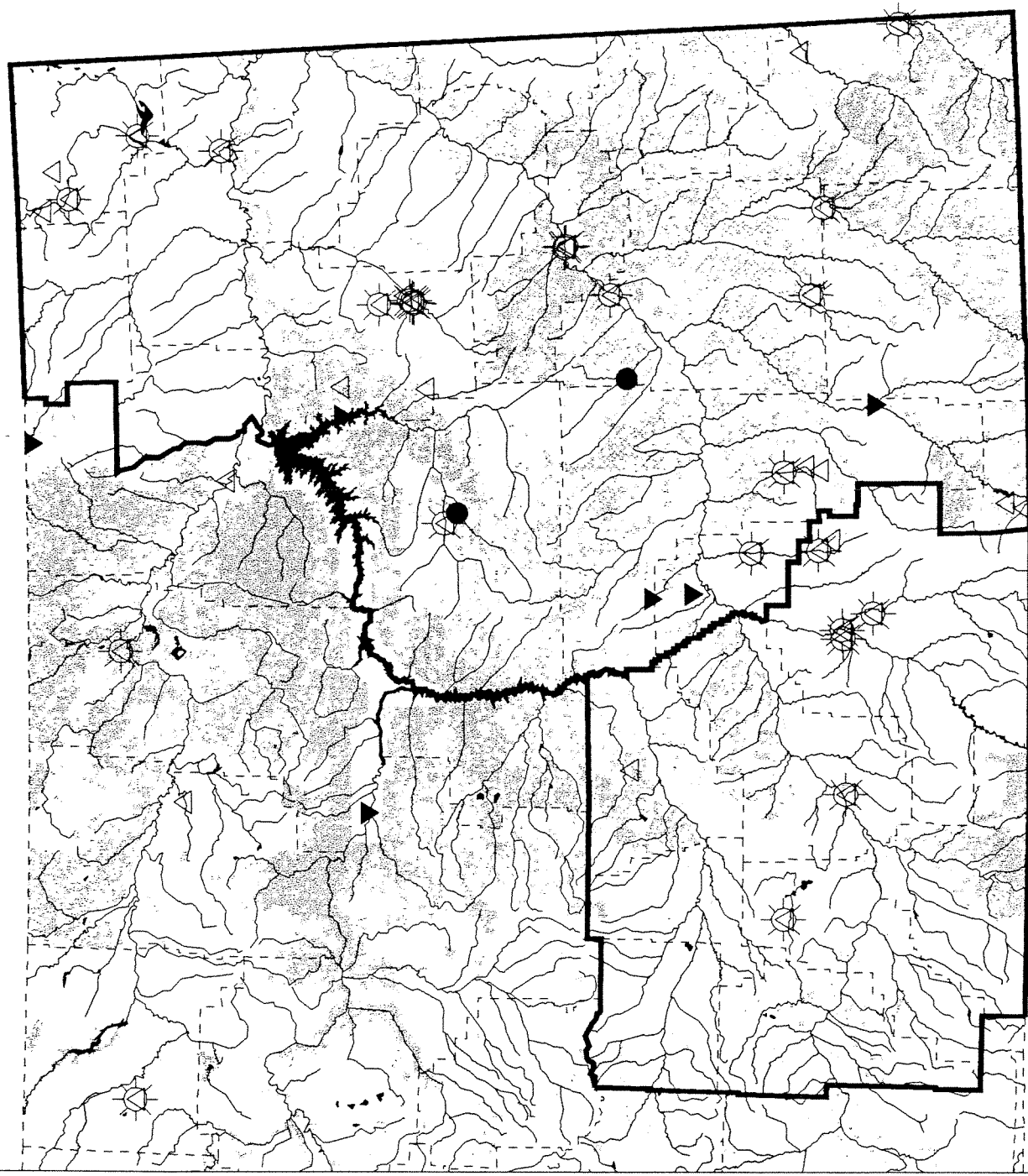
Status: The Racer is probably relatively common throughout much of eastern Montana, and was the most frequently encountered snake on the Ashland District, Custer National Forest (Hendricks and Reichel 1996). It was documented at 4 sites in 3 counties during the 1998 surveys (Appendix 2), and encountered 4 additional times in 4 counties (3 additional counties to those of the site surveys: Appendix 4). Although this species may be fairly common, any sightings should still be documented to help fill distribution gaps. Of particular interest would be documentation of any denning sites located.

Montana Natural Heritage Program rank: G5 S5.

Observations of
Heterodon nasicus
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Western Hognose Snake (*Heterodon nasicus*)

Description: The Western Hognose Snake is a mid-sized, heavy-bodied snake reaching 32". The dorsal ground color is yellowish- to grayish-brown, with 3 rows of darker brown to black blotches running down the back. The belly is dark gray to black, sometimes checkered. Its nose has a keel on the top and is upturned.

Eggs and Young: Clutches have 7-15 eggs which are white and elliptical, with thin, papery shells; length averages 32.5 mm (26-38 mm) and width 18 mm (14-23 mm). Young are 139-197 mm at hatching and are similar in color and pattern to adults (Platt 1969).

Similar Species: No other Montana snake has a keeled nose. Coloration is similar to both the Gopher Snake, Western Rattlesnake and juvenile Racer.

Habits and Habitat: The Western Hognose Snake is found on the plains of eastern Montana. It seems to prefer arid areas, farmlands and floodplains, and particularly areas of gravelly or sandy, loose soil. The keeled or shovel-like nose is thought to help it to dig down to its food, which it finds by smell. Apparently toads are its preferred food, though frogs, insects, and other small animals are also eaten (Platt 1969). It is active primarily during the daylight hours. Little is known of reproduction in Montana. It is likely that a female will only breed every other year in Montana. Road-killed adults were encountered on 25 and 28 June in 1998.

The Hognose is famous for its behavior in the face of a threat. At first it will puff up its neck, as does a cobra, and hiss and strike at its enemy. However, this is all a bluff; very rarely will it actually bite. If this threatening strategy does not work, it will pretend to die. It appears to go into convulsions, writhing on the ground, sticking its mouth in the dirt, and eventually rolling on its back and going into a trance that makes it appear to be dead. If turned right-side-up, it will roll back over and continue its deception. If left alone for a few minutes, it will right itself and continue on its way. The initial aggressive display and basic rattlesnake-like coloration cause many to be killed needlessly by people who mistakenly believe it to be venomous.

Surveying: They may be surveyed for by slowly walking through appropriate habitat and carefully watching for them; conducting surveys on warm, sunny days enhances sampling success. However, as with many lizards and snakes, they may easily be missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in pitfall or funnel traps with drift fences. Mark-recapture methods offer the best opportunity for determining population status.

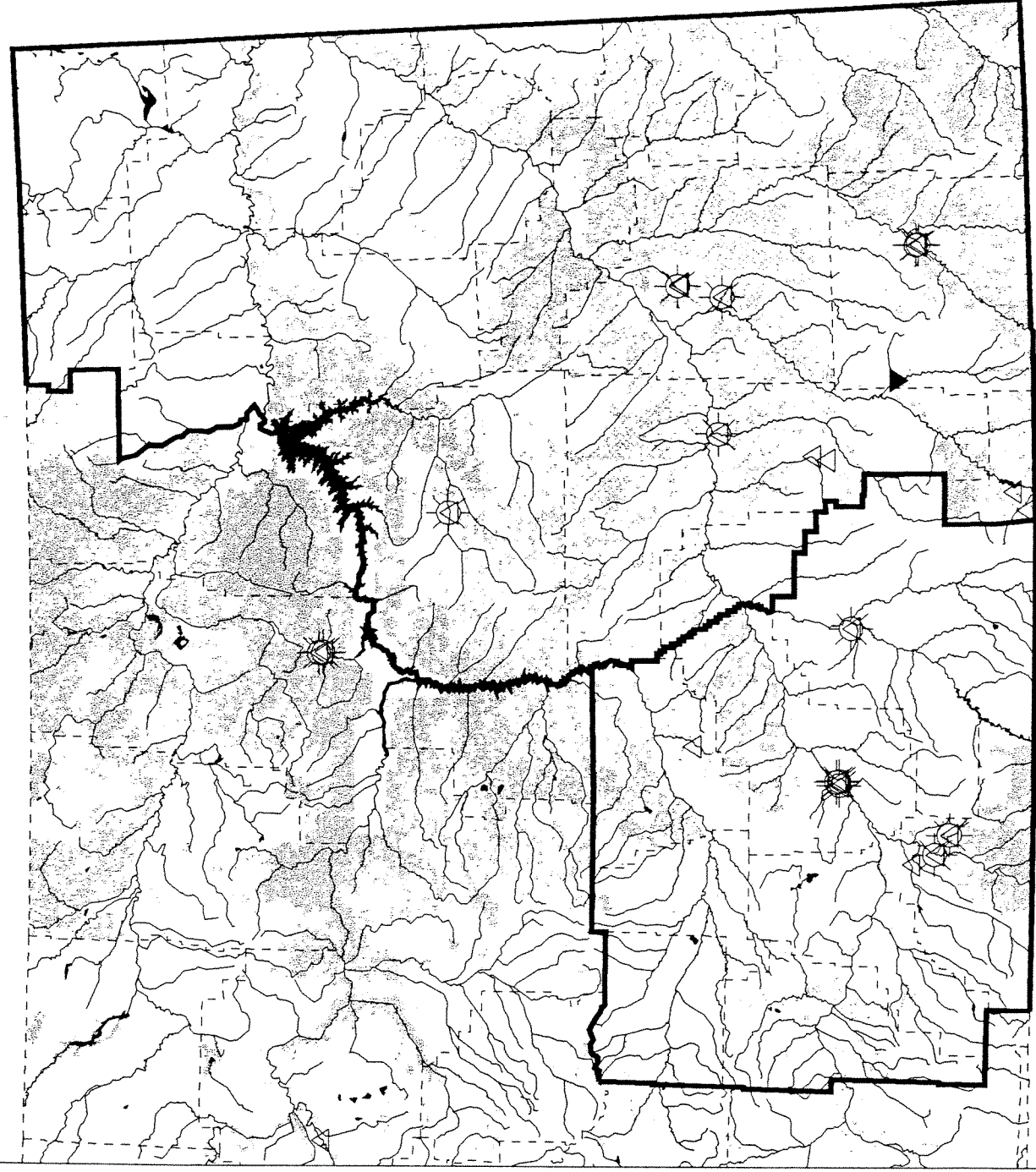
Status: Western Hognose Snakes are widespread in eastern Montana, but apparently not very abundant. There are relatively few reports of this species from Montana, even though they have been documented in the state since the passage of Lewis and Clark in 1805 (Burroughs 1995). There are only 5 records in the MTNHP database from within the boundary of the Miles City District, BLM since 1995. The species was encountered twice in 1998, from Custer and Garfield counties (Appendix 4). Hognose snakes are collected for the pet trade, and populations may be vulnerable to commercial collectors. Additionally, since toads are its preferred food, any decline in toad populations would be expected to negatively impact Western Hognose Snakes. Of particular interest would be documentation of any denning sites located. All encounters with this species should be documented.

Montana Natural Heritage Program rank: G5 S3?. Species of Special Concern.

Observations of
Lampropeltis triangulum
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Milk Snake (*Lampropeltis triangulum*)

Description: The Milk Snake is a slender and medium-sized snake (to 42 inches in length or more), with smooth scales. It has a jighly recognizable series of red to orange saddles or rings that are bordered by black bands and separated by white or yellow bands. Width of dark and light bands can vary markedly. The subspecies in Montana (*L. t. gentilis*) tends to be paler, with orange bands replacing red, and a light belly with few or no black spots.

Similar species: None in Montana.

Habitat and Habits: Little is known of Milk Snakes in Montana because only a few have been reported. In Wyoming and elsewhere they are usually found near cliffs, talus, outcrops, and rocky hillsides in forested and open country (Baxter and Stone 1985). They can be found in or under rotten logs. Milk Snakes are secretive and most active at night. They eat a variety of vertebrates, including other snakes, lizards, eggs, small mammals, and sometimes invertebrates such as earthworms and insects. Eggs are laid in mid-summer. Milk Snakes sometimes vibrate their tails when disturbed. Their name stems from an old tale alleging that these snakes milk cows.

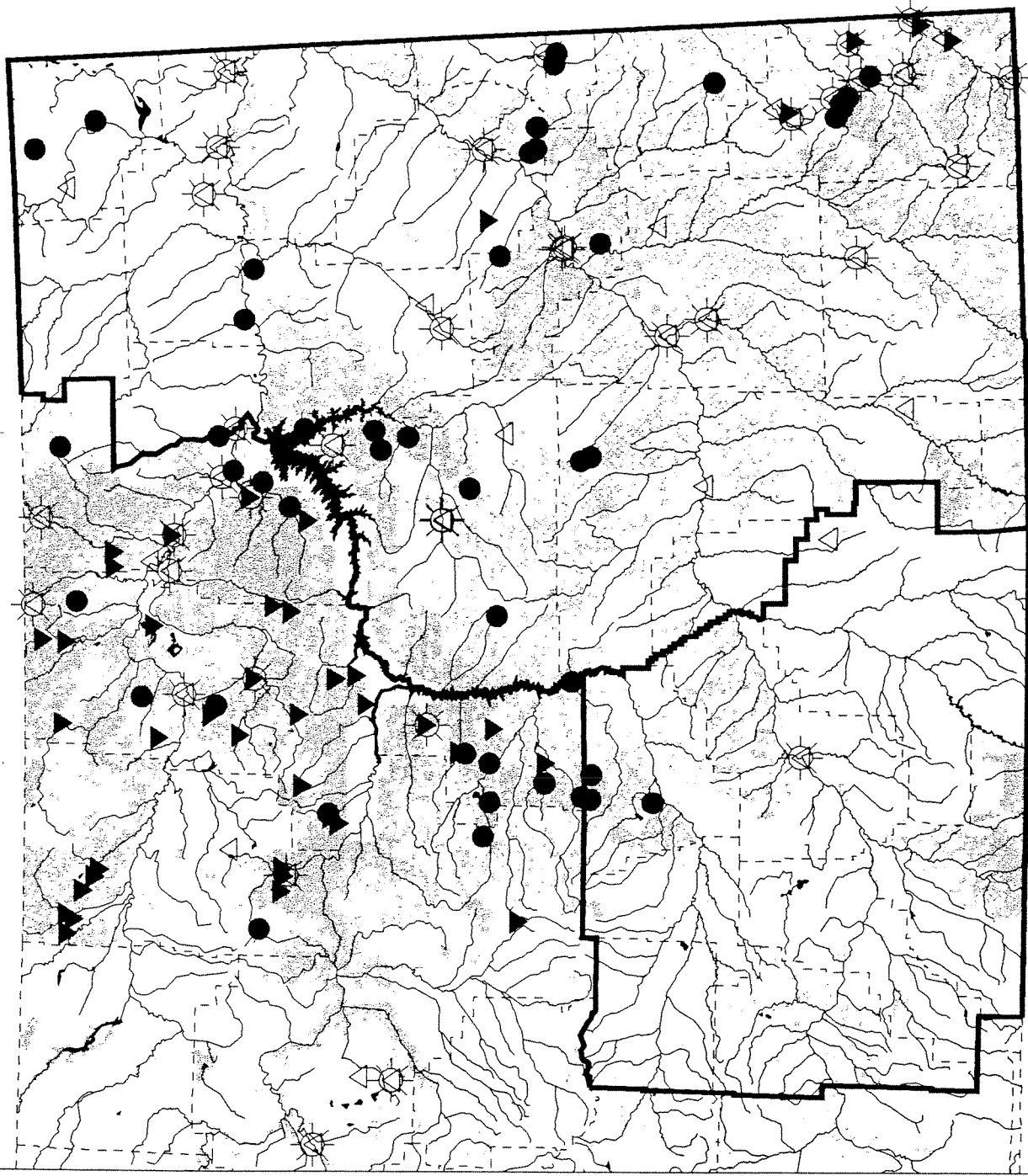
Surveying: Timed site surveys can be conducted around cliff bases and outcrops. Nocturnal surveys may be the most productive. Most distribution information, however, will likely come from recording incidental sightings. More intensive research may be done using funnel traps in combination with drift fences. The most intensive research and survey projects may use mark-recapture or radio-telemetry techniques.

Status: Milk Snakes are very rare and local in Montana. There is only one record since 1995 (Powder River County, near Ashland) from within the boundary of the Miles City District lands in the MTNHP database, although there are several older records from throughout the district area. The majority of records are clustered at only a few sites, such as near Bridger in Carbon County, and Billings in Yellowstone County. None were encountered during the 1998 inventory. The subspecies found in Montana is highly sought for the pet trade. All records of Milk Snakes should be fully documented. Of special interest would be documented denning sites.

Montana Natural Heritage Program rank: G5 S2. Species of Special Concern.

Observations of
 Thamnophis radix
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections



February 10, 1999
 Montana Natural Heritage Program

Plains Garter Snake (*Thamnophis radix*)

Description: The Plains Garter Snake ranges from 16-42" in length and has a dorsal background color of olive, brown, or black. It has a prominent orange or yellow dorsal stripe and a greenish-yellow stripe on each side located on the 3rd and 4th scale rows above the belly scales. It typically has black vertical bars on the upper lips.

Young: Young are live-born and resemble adults.

Similar species: The other garter snakes found in Montana have the lateral yellow lines on the 2nd and 3rd scale rows above the belly scales.

Habitat and Habits: Plains Garter Snakes are found in prairie habitats but are most common around wetland areas, where they feed around permanent and semi-permanent water bodies. In 1998, as many as 22 individuals, both adults (80-85 cm total length) and juveniles (30-40 cm total length) were seen along 400 m of shoreline at a single site (Blackfoot Reservoir, Carter County); most were sunning in or near shallow water around the reservoir with little emergent vegetation present. Fish, frogs, toads, mice and invertebrates are the most common food items in the diet of the Plains Garter Snake (Hammerson 1982a, Baxter and Stone 1985). Typical of most garter snakes, they emit a noxious secretion when handled and can be aggressive when disturbed. The Plains Garter Snake is a live-bearer, giving birth to 9-21 young during mid- to late-summer in Colorado (Hammerson 1982a). In 1998, this species was documented during surveys between 28 April and 24 July.

Surveying: Timed sight surveys may be conducted around wetlands and riparian feeding areas or at denning areas where higher concentrations of garter snakes occur; clear mornings may be the best survey times. Much distribution information may come from recording incidental sightings. More intensive research may be done using funnel traps in combination with drift fences. More intensive research and survey projects may use mark-recapture or radiotelemetry techniques.

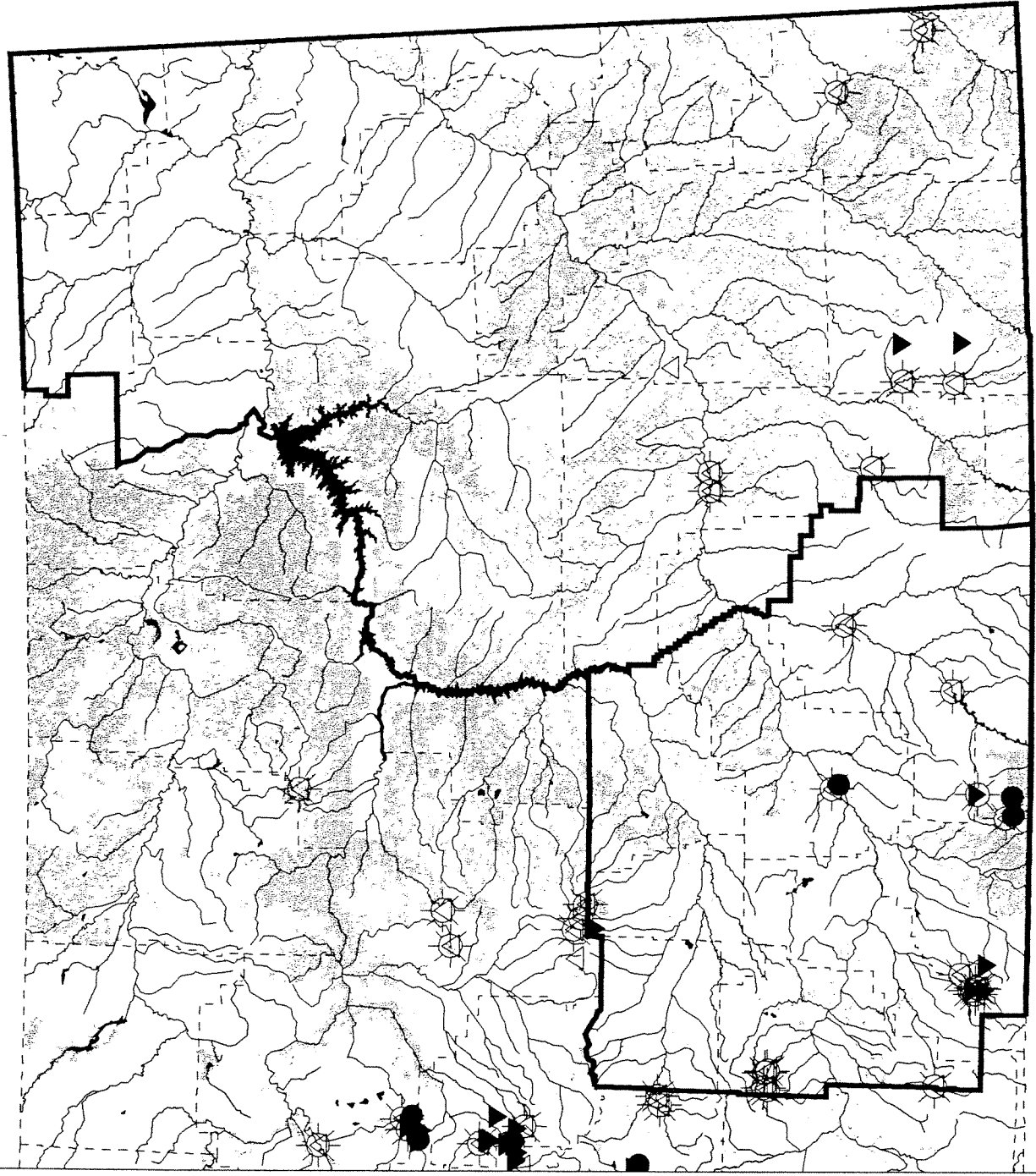
Status: This species is found over much of eastern Montana, particularly in the far eastern and north-central portions of the state. It is the most common garter snake in eastern Montana. Former status is unclear due to confusion in the identification of the 3 garter snakes that occur in the plains region. In 1998, this species was documented at 21 survey sites in 8 counties (Appendix 2). There were 7 additional encounters in 6 counties (2 counties not included in the survey records: Appendix 4). It should be watched for and any sightings should be documented with a description written at the time of observation, including how *radix* was distinguished from the other garter snakes. Of particular interest would be documentation of any denning sites located.

Montana Natural Heritage Program rank: G5 S4.

Observations of
Thamnophis elegans
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Western Terrestrial Garter Snake (*Thamnophis elegans*)

Description: Adult Western Terrestrial (or Wandering) Garter Snakes are smaller in body size than the Common Garter Snake, their length varying from 18-43". Three yellow longitudinal stripes are present (one dorsal, two lateral), but the dorsal stripe is much narrower than that of the Common Garter Snake. A distinctive feature of the Western Terrestrial Garter Snake is a series of alternating black spots which run the length of the body between, and somewhat on, the yellow stripes. The background color between the stripes tends to be more gray compared to the dark brown found in the Common Garter Snake. The ventral surface has a series of dark black/brown blotches which may cover most of the surface. The dorsal scales are keeled, and there are normally 8 upper labial scales.

Young: The coloration of young snakes is similar to that of the adults; young are live-born.

Similar species: See Common and Plains Garter Snakes.

Habitat and Habits: The habitat and habits of the Western Terrestrial Garter Snake are similar to the Common Garter Snake (i.e., they are found in most habitats but are particularly common around wetlands). Females give birth to 4-19 young during the summer (Stebbins 1985).

Records of adults from the Ashland area (Powder River County) were made between 28 June and 22 July at reservoirs or along streams (Hendricks and Reichel 1996).

Surveying: Timed sight surveys may be conducted around wetlands and riparian feeding areas or at denning areas where higher concentrations of garter snakes occur; clear mornings are best for surveys. Much distributional information may come from recording incidental sightings. More intensive research may be done using funnel traps in combination with drift fences. More intensive research and survey projects may use mark-recapture or radiotelemetry techniques.

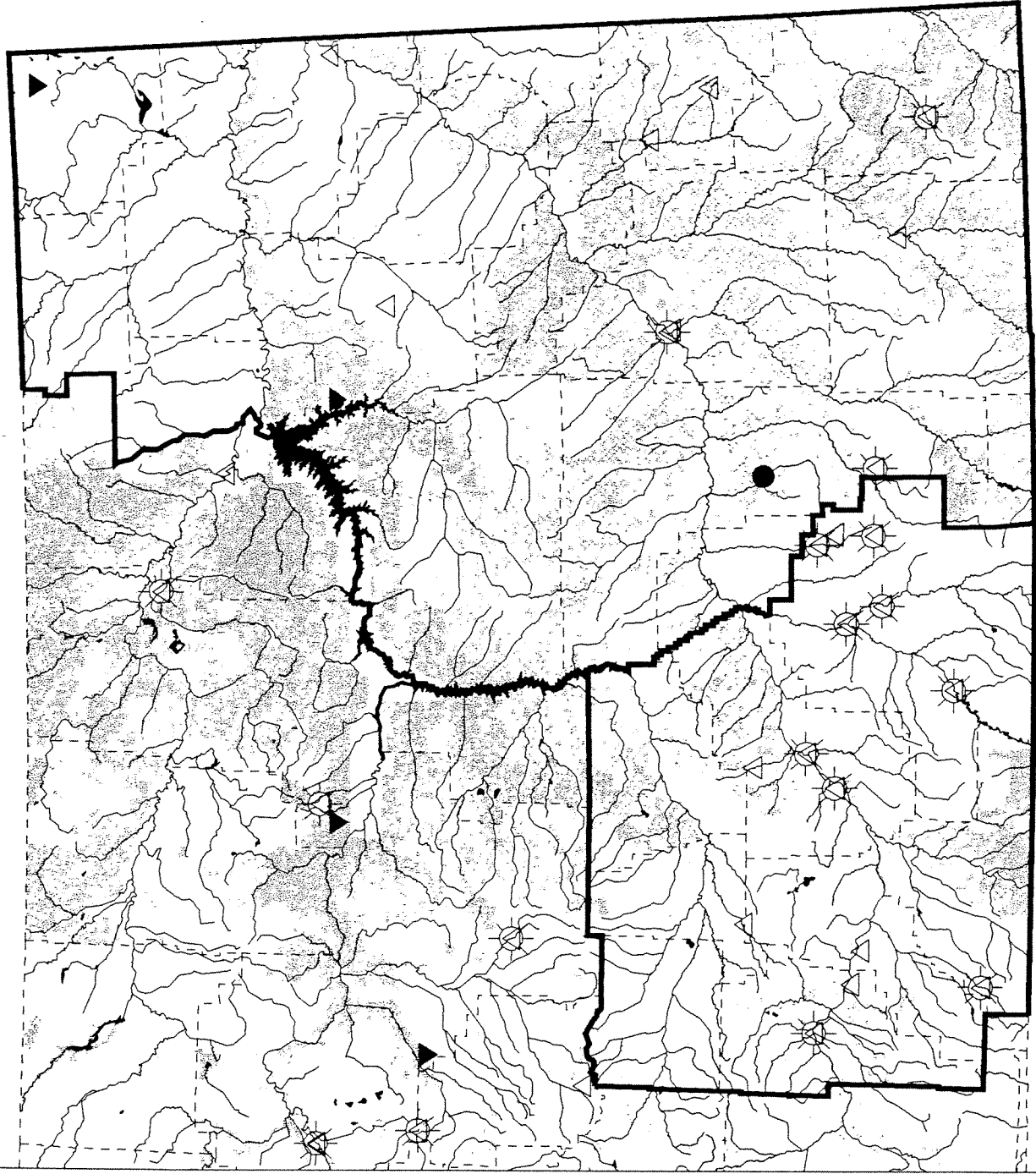
Status: Western Terrestrial Garter Snakes are most common in the western half of Montana, and are much less abundant on the plains, especially in the eastern third of the state. There are no records from the northeastern quarter. This species was not recorded during the 1998 surveys, but there were 1998 reports from Carbon and Yellowstone counties. There are only about 10 records since 1995 from within the boundaries of the former Miles City District. All records of garter snakes should be documented until the distribution of the three species is better understood; of particular interest would be documentation of denning sites.

Montana Natural Heritage Program rank: G5 S5.

Observations of
Thamnophis sirtalis
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Common Garter Snake (*Thamnophis sirtalis*)

Description: The Common Garter Snake consists of two color phases in western Montana, and ranges from 18-52" in length. Both phases have three yellow longitudinal stripes: one located dorsally and one on each side. Between the yellow stripes is a black stripe broken with red spots in one color phase but lacking red in the other. The form lacking red spots is not known from eastern Montana, but may be present there and should be watched for. Ventral coloration varies from yellow to bluish, and some individuals of the red-sided color phase have small black spots on the edge of the ventral scales. The dorsal scales are keeled, and normally there are 7 upper labial scales.

Young: The coloration of young snakes is similar to that of the adults; young are live-born.

Similar species: The Western Terrestrial Garter Snake has black spots overlapping the dorsal yellow stripe; the background color between stripes tends to be brownish. The Plains Garter Snake has the side yellow stripe on the 3rd and 4th scale rows above the belly scales and the dorsal stripe is often orange or red.

Habitat and Habits: Garter snakes are found in all forest habitats but are more common at lower elevations around marsh-bog-pond situations, where they prey on young fish, frogs, toads, mice and invertebrates. They are sometimes confused with water snakes because of their frequent aquatic exploits; in reality there are no "true" water snakes in Montana. Typical of most garter snakes, they emit a noxious secretion when handled and can be aggressive when disturbed. Garter snakes eat a variety of vertebrates and invertebrates, with the Common Garter Snake concentrating more on amphibians than the Western Terrestrial Garter Snake. The Common Garter Snake is a live-bearer, giving birth to 12-18 young during the summer in Colorado (Hammerson 1982a). This species was seen only once in 1998, on 23 April (Appendix 2).

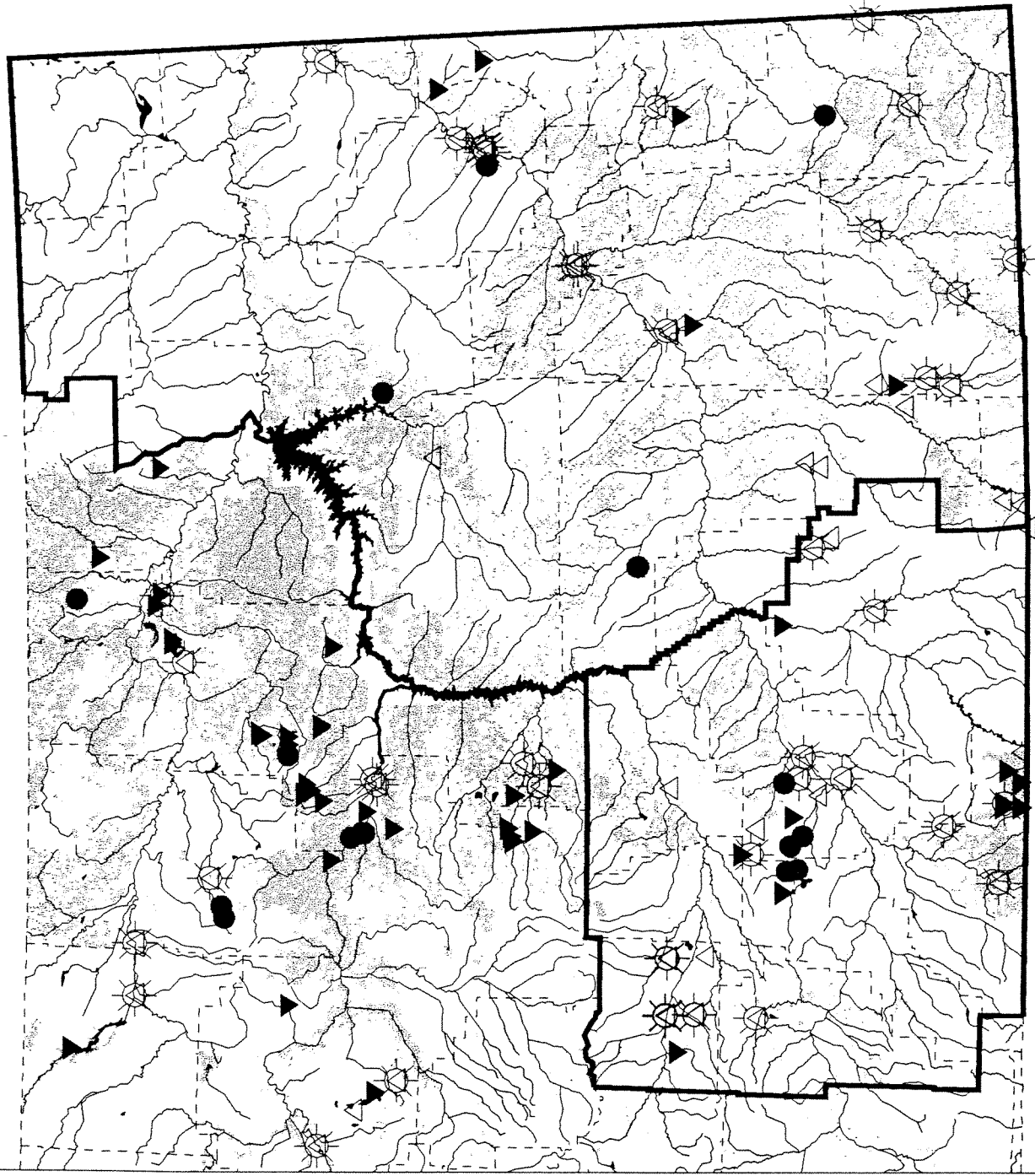
Surveying: Timed-sight surveys may be conducted around wetlands and riparian feeding areas or at denning areas where higher concentrations of garter snakes occur; clear mornings are the best survey times. Much distributional information may come from recording incidental sightings. More intensive research may be done using funnel traps in combination with drift fences. More intensive research and survey projects may use mark-recapture or radiotelemetry techniques.

Status: Common Garter Snakes are most common in western Montana, and infrequently reported from the plains of eastern Montana. There are only 5 records from the eastern half of the state since 1995. The single record for 1998 was made at Armells Creek in Rosebud County (Appendix 2). Some previous reports of this species may actually be misidentified Plains Garter Snakes. The Common Garter Snake appears to have a very patchy distribution in Wyoming (Baxter and Stone 1985), and this might be the case in eastern Montana as well. All records of garter snakes should be thoroughly documented until the distribution of the three species is better understood; of particular interest would be documentation of denning sites. Montana Natural Heritage Program rank: G5 S5.

Observations of
Crotalus viridis
 Miles City District
 BLM
 1995-1998

- 1998 records
- ▼ 1995-1997 records
- △ Pre-1995 records
- ☼ Museum collections

February 10, 1999
 Montana Natural Heritage Program



Western Rattlesnake (*Crotalus viridis*)

Description: Rattlesnakes have a heat-sensing pit located between the nostril and the eye. The fangs are hollow and hinged, allowing them to be folded back against the roof of the mouth. The head is triangular in shape and blunt-nosed. There are several white lines which run along the side of the head. Adult Western Rattlesnakes a stout body with total length ranging from 15-60 inches. The dorsal background color varies from pale green to brown with a series of brown or black blotches edged with a dark and then light line extending the length of the body. The blotches often merge into rings on the tail. There are also blotches on the sides of the body. The ventral side is pale yellow to white and without blotches. The scales are keeled. The tail ends in a rattle which helps to warn potential predators of the snake's presence. The young have the same color pattern, but are brighter in color than adults.

Similar species: No other snake in Montana has rattles, but see Racer, Gopher Snake and Western Hognose Snake which may have similar color patterns.

Habitat and Habits: The Western Rattlesnake is an inhabitant of more open and arid country, but it is also found in Ponderosa pine stands or mixed-grass coniferous forests. It is more likely to be encountered on south-facing slopes and areas of rock outcrops. It is feared due to its poisonous bite and therefore often needlessly killed. Rattlesnakes may den in large numbers, moving up to 7 miles out from the dens during the summer (Peterson, pers. comm.); den sites are most common in south-facing talus slopes. In Wyoming, it is found at elevations of over 8500 feet (Baxter and Stone 1985). Rattlesnakes prey on a variety of animals including mice, ground squirrels, rabbits, amphibians, and other snakes. Females in Colorado give birth to 4-21 live young during the summer (Hammerson 1982a). In 1998, this species was seen between 4 May and 22 July (Appendix 4). In 1995 in Carbon County, they were reported between 2 July (a juvenile, 39 cm total length) and 11 September. Most records from the Ashland and Sioux districts, Custer National Forest are from June and July (Reichel 1995, Hendricks and Reichel 1996), but one was reported on 27 September 1995.

Surveying: Walk-through surveys on warm sunny days are probably among the best methods for determining presence/absence. This species is easiest to find near den sites in spring and fall. Funnel traps and night driving are both effective techniques. Snakes are often encountered sunning on roads in the morning. Mark-recapture methods can be used to determine more precise numbers.

Status: The Western Rattlesnake is more common in eastern Montana than MTNHP records indicate. Most encounters with this species do not get reported. In 1998, the species was recorded 4 times from 4 counties (Appendix 4), and 4 more times from Carbon County in 1995. Other 1998 reports are from Stillwater and Yellowstone counties. The species is widespread across the eastern part of the state. Nevertheless, there are no records whatsoever from the 3 northeastern counties north of the Missouri River, and no records from north of the river in adjacent North Dakota (Wheeler and Wheeler 1966) or Saskatchewan (Secoy and Vincent 1976). The habit of denning at traditional sites in large numbers makes rattlesnakes vulnerable to commercial collecting or simply killing by fearful people. Observations of Western Rattlesnakes should be reported to document the presence of this species elsewhere and to fill in distribution gaps; of particular interest would be documentation of any denning sites located.

Montana Natural Heritage Program rank: G5 S4.

Species marginal, historical, or potentially present within the Miles City District, BLM

This section lists 1) species whose affinities are generally restricted to montane habitats of the western third of the state, 2) species not documented in over 30 years from within the boundaries of the former Miles City District, and 3) species that might still be documented from within the boundaries of the former district. None of the species discussed in this section, except perhaps species from the first category, are very likely to be recorded from lands under BLM stewardship in the former Miles City District. Even the marginal species are unlikely to be recorded on the very small tracts that occur in the far southwestern counties (Stillwater, Sweet Grass, and Wheatland) without concentrated and repeated survey effort.

1) Marginal Species

Western Toad (*Bufo boreas*): There are 3 records in the Miles City District, from Carbon County (West Fork Rock Creek in the Beartooth Mountains), Sweet Grass County (near Big Timber) and Wheatland County (near Harlowton). This species is a typical montane form found in intermontane valleys to treeline, and unlikely to be found very far from mountain habitats. Adults are distinguished from other Montana toads by lacking cranial crests.

Columbia Spotted Frog (*Rana luteiventris* [= *pretiosa*]): There are 3 records from the Beartooth Mountains (East Rosebud Creek) and Crazy Mountains (Big Timber Creek) in the far western region of the Miles City District in Carbon and Sweet Grass counties. This species is found in western Montana in intermountain valleys to treeline, and is unlikely to be encountered far from mountains. An isolated population is reported from the Big Horn Mountains in Wyoming (Dunlap 1977), and may occur in the portions of this range that cross the border into Montana in Big Horn County. Columbia Spotted Frogs can be distinguished from Northern Leopard Frogs by noting a) **spot pattern** (smaller on spotted frogs with a light point in the middle of a dark spot, while leopard frog spots are larger, with a dark middle surrounded by a lighter halo), and b) **ventral leg color** (undersides of spotted frog legs are reddish-orange while those of leopard frogs are white to cream-colored).

Rubber Boa (*Charina bottae*): There is only 1 record of this species in the Miles City District, from along the Boulder River in the Absaroka Mountains of Sweet Grass County. This is the only boa in Montana and cannot be confused with any other native snake. The eyes and scales are very small, the tip of the tail is blunt and similar to the head-end. The back is uniform brown or dull green, and the belly cream to tan.

2) Historical Species

Canadian Toad (*Bufo hemiophrys*): This species has been documented (confirmed) only once in the Miles City District and in Montana. Two adults were collected at a pothole 1 mi W of Flaxville, Daniels County, on 30 July 1966 (Black and Bragg 1968). Because no additional records have been reported in > 30 years, the species is considered historical in Montana. There have been few additional surveys in the far northeastern counties, so the species may yet reappear. The Flaxville site was visited in 1998 (Appendix 1), but only Northern Leopard Frogs were

detected during the survey (Appendix 2). This species is distinguished from other Montana toads by having parallel cranial crests fused into a lump between the eyes and lacking post-orbital extensions of the crests. Woodhouse's Toad lacks the lump between the eyes and has well-developed post-orbital crests; Great Plains Toad has converging cranial crests and well-developed post-orbital crests, but also has large white-bordered dark *dorsal* patches that the Canadian Toad lacks.

3) Potential Species

Wood Frog (*Rana sylvatica*): This species is not yet known to occur in Montana, although there are a couple of non-breeding records from inappropriate habitat that are considered as introductions. The species might occur in eastern Montana in the Big Horn Mountains of Big Horn County. Wood Frogs have been documented from the Wyoming portion of the mountain range (Dunlap 1977). Wood Frogs are found near water in forested habitats, especially in small natural ponds and sometimes in backwaters and beaver ponds. It is unlikely to be documented on lands under BLM stewardship in eastern Montana. Adults have a prominent black facial mask extending from the snout to behind the external ear drum. There may be some spotting on the back, and the belly is white to cream-colored.

RECOMMENDATIONS

Surveys and Research

1) Incidental sightings of amphibians and reptiles from the Miles City District should be recorded and forwarded to the Natural Heritage Program. Of particular interest are all observations and locations of breeding amphibians (tadpoles and/or eggs) and all reptiles. Use Reichel and Flath (1995) as an identification aid. Vouchers of amphibian tadpoles can be sent to the Natural Heritage program for identification. The Natural Heritage website has an online form for submitting amphibian and reptile observation data at <http://nris.mt.gov/mtnhp/index.html>.

2) Due to the time constraints and the large area covered in this survey, it should not be regarded as a definitive index of all the amphibians and reptiles or their presence on the surveyed area. The secretive habits of many amphibians and reptiles, and our lack of knowledge regarding their reproductive behavior make it difficult to assess their overall status. We recommend that additional surveys be conducted.

3) Long-term monitoring of typical marsh-pond habitats at several sites in the Miles City District should be established. Sites might include Ute Reservoir in Carter County, Beardsley Reservoir in Custer County, Bailer Reservoir in Dawson County, Upper Labell Reservoir in Dawson County, the reservoir on the branch of Snap Creek in Garfield County, Split Reservoir in McCone County, Clark, Silvertip, and Homestead reservoirs in Prairie County, Missouri River oxbow pond in Richland County, and Armells Creek oxbow marsh and Sunday Butte reservoir in Rosebud County (see Appendix 1 and 2). These monitoring sites permit assessment of population trends and breeding success of the more common species: Tiger Salamander, Western Chorus Frog, Woodhouse's Toad, Northern Leopard Frog, and Plains Garter Snake. Particular attention needs to be given to any toad and Northern Leopard Frog breeding sites found. Life history and ecology of the amphibians in Montana is still poorly known for most species. Long-term monitoring will provide information on timing of breeding and habitat requirements needed for successful reproduction, as well as the kind of information needed for successful management of local populations.

Management

1) With an increasing number of amphibian species declining for a variety of reasons, it is reasonable to manage habitat to support them. While not all ways of preserving and protecting these species are currently known, several management actions could impact them negatively. Amphibians cannot survive without adequate breeding sites, and the type of water used is often species-specific.

A) Stocking fish in ponds and reservoirs currently lacking fish, and in which amphibians breed, should be carefully evaluated. Fish introductions are thought to be a major factor negatively impacting amphibian populations in California (Hayes and Jennings 1986, Fellers and Drost 1993, Drost and Fellers 1996) and Oregon (Kiesecker and Blaustein 1998). It may even be desirable to remove introduced fish from some water bodies.

B) When altering springs and seeps for livestock, protect a portion of the area that is suitable

for amphibian reproduction. This could include small fenced exclosures *above* water diversions to stock tanks; water from natural springs and seeps should not be diverted immediately into stock tanks, as this could exclude amphibians from access to the water. At sites with significant overflow from wells and tanks, consider creating livestock exclosures along portions of the outflow. Consider fencing off sections of ponds and reservoirs that include shoreline emergent vegetation. This provides egg-laying sites and cover to immature amphibians, and also provides adults and immature stages with refugia from trampling by livestock. Exclosures at ponds and smaller reservoirs should be designed to account for water loss during evaporative drawdown, and encompass some water that will last at least to mid-August if possible.

- C) Create new ponds exclusively for amphibians to which livestock are excluded. Creation of buffer zones (Semlitsch 1998) around these sites (and other sites as well) should also be considered, as the standing water in wetlands is used primarily for breeding and tadpole/larval development, not for much of adult activity by several species of semi-aquatic amphibians (such as Tiger Salamanders and the toads). Semi-aquatic species may disperse from large distances (> 2 km perhaps) to wetland sites to breed. Adult habitats also need to be considered in any active management program for amphibians.
- 2) A critical component of the life cycle in snakes is the wintering den. Many species hibernate in large aggregations at traditional den sites. Often these hibernacula are used by more than one species (Koch and Peterson 1995), and mating often takes place at or near the den site. Snakes then move away from dens for as much as 6 miles in summer, returning in the fall to over-winter. These sites typically are situated where snakes can get well down into an area of fractured rock, often near cliffs or in talus slopes. While these sites are robust, they are vulnerable to disturbance, such as road building, or vandalism and over-collecting. Den sites should be documented and protected. Fencing around dens might be suitable in some situations to exclude livestock. Sites should be monitored annually to determine use and relative abundance of species present. Den locations should be revealed only to responsible individuals. The Western Rattlesnake and Milk Snake are of special concern. Rattlesnakes are subjected to needless killing by the public at large, and susceptible to harvesting by unauthorized individuals selling venom and meat for commercial purposes. Local extermination is a real possibility. Milk Snakes are highly valued by the pet trade, and over-harvest at dens is a real possibility. Den site locations of this species should be shared only under special circumstances.
 - 3) Traditional nesting sites of Common Snapping Turtles and Spiny Softshells, both BLM Special Status species, should be protected from disturbance of any kind, through use of livestock exclosures if necessary. Most nesting sites, however, will be near larger rivers and tributaries in sandy and sand-deposition sites, and subjected to flooding and shifts in channels. Protection of individual nests may include establishing predator exclosures around clutches. This would be necessary only if it is evident that predators (skunks and raccoons in particular) are destroying an exceptional number of nests. Predation of turtle nests is often >50% in many areas, but "normal" predation rates for Montana populations are not known.

BIBLIOGRAPHY

- Baxter, G. T. and M. D. Stone. 1985. Amphibians and reptiles of Wyoming. Second edition. Wyoming Game and Fish Department. Cheyenne, Wyoming. 137 pp.
- Bergeron, D. No date. Terrestrial wildlife survey, Coal Creek Mine Area, Montana, 1977-1978. West. Tech. & Eng., Inc., Helena.
- Bernard, S. R. and K. F. Brown. 1977. Distribution of mammals, reptiles, and amphibians by BLM physiographic regions and A. W. Kuchler's associations for the eleven Western States.
- Black, J. H. 1967. A blue leopard frog from Montana. *Herpetologica* 23 (4):314-315.
- Black, J. H. 1969. The frog genus *Rana* in Montana. *Northwest Sci.* 43:191-195.
- Black, J. H. 1970. Amphibians of Montana. Mont. Fish & Game Dept., Pub. No. 1 of Animals of Montana Series.
- Black, J. H. 1970. Some aspects of the distribution, natural history and zoogeography of the toad genus *Bufo* in Montana. M.S. thesis, University of Montana, Missoula.
- Black, J. H. 1970. Turtles of Montana. Montana Wildlife, Animals of Montana Series 2:26-32.
- Black, J. H. 1971. The toad genus *Bufo* in Montana. *Northwest Sci.* 45: 156-162.
- Black, J. H. and A. M. Bragg. 1968. New additions to the herpetofauna of Montana. *Herpetologica* 24:247.
- Black, J. H. and R. B. Brunson. 1971. Breeding behavior of the boreal toad *Bufo boreas boreas* (Baird and Girard) in western Montana. *Great Basin Nat.* 31: 109-113.
- Black, J. H. and V. Craig (eds.). 1970. Amphibians of Montana. Montana Wildlife, Animals of Montana Series 1:1-32.
- Bragg, A. N. 1940. Observations on the ecology and natural history of Anura. I. Habits, habitat and breeding of *Bufo cognatus* Say. *Amer. Nat.* 74:322-438.
- Breckenridge, W. J. and J. R. Tester. 1961. Growth, local movements, and hibernation of the Manitoba toad, *Bufo hemiophrys*. *Ecology* 42:637-646.
- Brunson, R. B. 1952. Recent collections of *Bufo boreas boreas* from western Montana. *Proc. Montana Acad. Sci.* 11:17-19.
- Brunson, R. B. 1955. Check list of the amphibians and reptiles of Montana. *Proc. Mont.*

- Academy Sci. 15:27-29.
- Brunson, R. B., and H. A. Demaree, Jr. 1951. The herpetology of the Mission Mountains, Montana. *Copeia* 1951:306-308.
- Bureau of Land Management. 1982. Bloomfield - North Fork baseline inventories - wildlife. Miles City, MT.
- Burroughs, R. D. 1995. The natural history of the Lewis and Clark Expedition. Michigan State University Press, East Lansing. 340 pp.
- Bury, R. B., P. S. Corn, K. B. Aubry, F. F. Gilbert, and L. L. C. Jones. 1991. Aquatic amphibian communities in Oregon and Washington. USDA For. Serv., Pacific NW Res. Station Gen Tech. Rep. PNW-GTR-285:353-362.
- Camp, Dresser, and McKee, Inc. 1981. Anaconda Stillwater project 12-month environmental baseline report. Tech. Rpt. for Anaconda Copper Co.
- Carey, C. 1993. Hypothesis concerning the causes of the disappearance of boreal toads from the mountains of Colorado. *Conservation Biology* 7(2):355-362.
- Censky, E. J. 1986. *Sceloporus graciosus*. Cat. Amer. Amphibians and Reptiles 386.1-4.
- Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. Second edition. Houghton Mifflin Co., Boston. xvii + 429 pp.
- Cope, E. D. 1879. A contribution to the zoology of Montana. *American Naturalist* 13:432-441.
- Corn, J., and P. Hendricks. 1998. Lee Metcalf National Wildlife Refuge bullfrog and painted turtle investigations: 1997. Montana Natural Heritage Program. Helena, MT. 20 pp.
- Corn, P. S. No Date. Comment on the occurrence of *Pseudacris clarki* in Montana. *Bull. Chi. Herp. Soc.* 15(3):77-78.
- Corn, P. S. and J. C. Fogelman. 1984. Extinction of montane populations of northern leopard frog (*Rana pipiens*) in Colorado. *J. Herpetol.* 18:147-152.
- Craig, V. No date. The Axolotl "Walking Fish." *Montana Outdoors?* 2 pp.
- Cutright, P. R. 1989. Lewis and Clark: pioneering naturalists. University of Nebraska Press, Lincoln. 506 pp.
- Davis, C. V. and S. E. Weeks. 1963. Montana Snakes. Montana Dept. of Fish and Game, Helena, MT, pp.1-10.

- Diller, L. V., and R. L. Wallace. 1996. Comparative ecology of two snake species (*Crotalus viridis* and *Pituophis melanoleucus*) in southwestern Idaho. *Herpetologica* 52:343-360.
- Dood, A. R. 1980. Terry Badlands nongame survey and inventory: final report. Montana Department of Fish, Wildlife, and Parks BLM Contract #YA-512-CT8-217. 70 pp.
- Drost, C. A., and G. M. Fellers. 1996. Collapse of a regional frog fauna in the Yosemite area of the California Sierra Nevada, USA. *Conservation Biology* 10:414-425.
- Dunlap, D. G. 1977. Wood and Western Spotted frogs (Amphibia, Anura, Ranidae) in the Big Horn Mountains of Wyoming. *Journal of Herpetology* 11:85-87.
- Dunlap, D. G., and K. C. Kruse. 1976. Frogs of the *Rana pipiens* complex in the northern and central plains states. *Southwestern Naturalist* 20:559-571.
- Econ, Inc. 1974. Terrestrial wildlife inventory for the Lame Jones and Ismay coal lease tracts. Tech. Rpt.
- Ernst, C. H. 1971. *Chrysemys picta*. Cat. Am. Amph. Rep. 106.1-106.4.
- Ernst, C. H., J. E. Lovich, and R. W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 578 pp.
- Farmer, P. J. and K. Burgess. 1983. Jardine area baseline terrestrial wildlife study, May 15, 1981-May 15, 1982, for Homestake Mining Co. West. Tech. Eng., Helena.
- Farmer, P. J. and K. Burgess. 1984. Jardine area baseline terrestrial wildlife study. West. Tech. & Eng., Helena.
- Farmer, P. J. No date. Terrestrial wildlife survey, Pearl area, Montana, June, 1976 - June, 1977. Westech, Inc., Helena, MT.
- Farmer, P. J., S. B. Heath, D. J. Bergeron and K. L. Scow. 1985. Montana Tunnels project-baseline terrestrial wildlife study. Westech, Inc., Helena, MT. for Centennial Minerals, Inc.
- Feighley, H. P. 1997. Colonial nesting bird survey on the Bureau of Land Management Lewistown District: 1996. Montana Natural Heritage Program. Helena, MT. 27 pp. [herp locations in appendix]
- Fellers, G. M., and C. A. Drost. 1993. Disappearance of the Cascades Frog *Rana cascadae* at the southern end of its range, California, USA. *Biological Conservation* 65:177-181.
- Finch, D. M. 1992. Threatened, endangered, and vulnerable species of terrestrial vertebrates in the Rocky Mountain Region. USFS General Technical Rep. RM-215. 38 pp.
- Fitch, H. S. 1980. *Thamnophis sirtalis*. Cat. Am. Amph. Rep. 270.1-270.4.

- Fitch, H. S. 1983. *Thamnophis elegans*. Cat. Am. Amph. Rep. 320.1-320.4.
- Fitch, H. S. and T. P. Maslin. 1961. Occurrence of the garter snake, *Thamnophis sirtalis*, in the Great Plains and Rocky Mountains. University of Kansas Publications, Museum of Natural History 13(5):289-308.
- Flath, D. L. 1981. Vertebrate species of special concern. Montana Department of Fish, Wildlife, and Parks. 74 pp.
- Flath, D. L. 1984. Vertebrate species of special interest or concern: mammals, birds, reptiles, amphibians, fishes. Wildlife Division, Montana Department of Fish, Wildlife, and Parks. 76 pp.
- Gehlbach, F. R. 1967. *Ambystoma tigrinum*. Cat. Am. Amph. Rep. 52.1-52.4.
- Gibbons, J. W., S. S. Novak and C. H. Ernst. 1988. *Chelydra serpentina*. Cat. Am. Amph. Rep. 420.1-420.4.
- Halliday, T., and K. Adler. 1991. Encyclopedia of reptiles and amphibians. Facts on File, New York. 143 pp.
- Hammerson, G. A. 1982a. Amphibians and reptiles in Colorado. Colorado Division of Wildlife, Denver. vii + 131 pp.
- Hammerson, G. A. 1982b. Bullfrog eliminating leopard frogs in Colorado? Herpetol. Rev. 13:115-116.
- Hart, M. M., W. A. Williams, P. C. Thornton, K. P. McLaughlin, C. M. Tobalske, B. A. Maxell, D. P. Hendricks, C. R. Peterson, and R. L. Redmond. 1998. Montana atlas of terrestrial vertebrates. Unpublished report. Montana Cooperative Wildlife Research Unit, The University of Montana, Missoula. vii + 1302 pp.
- Hendricks, P. 1996. Geographical distribution. *Thamnophis elegans vagrans*. Herpetological Review 27(2):89.
- Hendricks, P., and J. D. Reichel. 1996. Preliminary amphibian and reptile survey of the Ashland District, Custer National Forest: 1995. Montana Natural Heritage Program. Helena, MT. 79 pp.
- Hendricks, P., and J. D. Reichel. 1998. Amphibian and reptile survey on Montana refuges: 1996. Montana Natural Heritage Program. Helena, MT. 19 pp.
- Heyer, W. R., M. A. Donnelly, R. W. McDiarmid, L. C. Hayek, and M. S. Foster (eds.). 1994. Measuring and monitoring biological diversity: Standard methods for amphibians. Smithsonian Institution Press, Washington, D.C. 364 pp.

- Holroyd, G. L., G. Burns and H. C. Smith (eds). 1991. Proceedings of the second endangered species and prairie conservation workshop. Provincial Museum of Alberta, Nat. Hist. Occ. Pap. 15. 284 pp.
- Jellison, W. L. and J. H. Black. 1970. Tularemia in Montana and turtles of Montana. Mt. Wildlife, Nov. 1970. Mont. Fish & Game Dept.
- Kerfoot, W. C. 1968. Geographic variability of the lizard, *Sceloporus graciosus* Baird and Girard, in the eastern part of its range. Copeia 1968:139-152.
- Kiesecker, J. M., and A. R. Blaustein. 1998. Effects of introduced Bullfrogs and Smallmouth Bass on microhabitat use, growth, and survival of native Red-legged Frogs (*Rana aurora*). Conservation Biology 12:776-787.
- Koch, E. D., and C. R. Peterson. 1995. Amphibians and reptiles of Yellowstone and Grand Teton national parks. University of Utah Press. Salt Lake City, Utah. 188 pp.
- Koonz, W. H. 1993. Amphibians in Manitoba. pp. 273-275. IN: Holroyd, G. L., H. L. Dickson, M. Regnier and H. C. Smith (eds). Proceedings of the Third Prairie Conservation and Endangered Species Workshop. Provincial Museum of Alberta, Nat. Hist. Occ. Pap. 19. 384 pp.
- Leonard, W. P., H. A. Brown, L. L. C. Jones, K. R. McAllister, and R. M. Storm. 1993. Amphibians of Washington and Oregon. Seattle Audubon Society. Seattle, Washington. 168 pp.
- Mackie, R. J. and G. L. Dusek. 1993. A bibliography of Montana wildlife literature through 1992, DRAFT. Wildlife Management Programmatic Environmental Impact Statement Project, Montana Department of Fish, Wildlife, and Parks. 280 pp.
- Marnell, L. F. 1997. Herpetofauna of Glacier National Park. Northwestern Naturalist 78:17-33.
- Martin, P. R. 1980. Terrestrial wildlife habitat inventory in southeastern Montana. MT Dept. of Fish, Wildlife and Parks and BLM.
- Martin, P. R. 1980. Terrestrial wildlife inventory in selected coal areas of Montana. MT. Dept. of Fish, Wildlife and Parks and BLM.
- Matthews, W. L. no date. Wibaux-Beach wildlife baseline study – nongame species. Unpublished report. BLM Miles City District, Miles City, MT. 93 pp.
- Matthews, W. L. 1980. Wibaux-Beach comparison study: Sidney, Glendive and Plevna study areas. Unpublished report. BLM Miles City District, Miles City, MT. 50 pp.
- Matthews, W. C. 1981. Broadus-Pumpkin Creek baseline inventory - wildlife. Unpublished report. BLM Miles City District, Miles City, MT.

- McEneaney, T. and J. Jensen. 1974. The reptiles and amphibians of the Charles M. Russell National Wildlife Refuge, 1974. Unpubl. mimeo. 3 pp.
- Micken, L. 1968. Some summer observations on the tiger salamander, *Ambystoma tigrinum*, in Blue Lake, Madison County Montana. Proc. Mont. Acad. Sci. 28:77-80.
- Micken, L. 1971. Additional notes on neotenic *Ambystoma tigrinum melanostictum* in Blue Lake, Madison County, Montana. Proc. Mont. Acad. Sci. 31:62-64.
- Miller, J. D. 1978. Observations on the diet of *Rana pretiosa*, *Rana pipiens*, and *Bufo boreas* from western Montana. Northwest Science 52:243-249.
- Montana Department of State Lands and U. S. Office of Surface Mining. 1982. Final EIS, Western Energy Company's Rosebud Mine Area C, Block 1.
- Montana Department of State Lands. No date. Draft EIS, proposed plan of mining and reclamation, Zortman Mining Company and Landusky Mining Company, Phillips County, MT.
- Mosimann, J. E. and G. B. Rabb. 1952. The herpetology of Tiber Reservoir Area, Montana. Copeia 1952:23-27.
- Mueller, C. F. 1969. Temperature and energy characteristics of the sagebrush lizard (*Sceloporus graciosus*) in Yellowstone National Park. Copeia 1969:153-160.
- Mueller, F. C. and R. E. Moore. 1969. Growth of the sagebrush lizard, *Sceloporus graciosus*, in Yellowstone National Park. Herpetologica 25:35-38.
- Nelson, D. J. 1948. *Lampropeltis triangulum gentilis* in Montana. Herpetologica 4:170.
- Nelson, D. J. 1950. *Lampropeltis triangulum gentilis* in Montana. Herpetologica 6:41.
- Nussbaum, R. A., E. D. Brodie, Jr. and R. M. Storm. 1983. Amphibians and reptiles of the Pacific Northwest. Univ. Press of Idaho. 332 pp.
- Olson, D. H., W. P. Leonard, and R. B. Bury (eds.). 1997. Sampling amphibians in lentic habitats. Northwest Fauna Number 4. 134 pp.
- Olson-Elliott and Associates. 1979. Environmental impact of the northern tier pipeline in Montana. Tech. Report prepared for Montana Department of Natural Resources and Conservation.
- Olson-Elliott and Associates. 1980. Terrestrial wildlife inventory, Montco wildlife study area. Tech. Report for Montco, Billings, MT.

- Ortenburger, A. I. 1921. An eastern record and note on *Charina bottae* (Blainville). Copeia 100:84.
- Peterson, C. R., E. D. Koch and P. S. Corn. 1992. Monitoring amphibian populations in Yellowstone and Grand Teton National Parks. Unpubl. Report to Univ. Wyo. Natl. Park Serv. Res. Center. 37 pp.
- Phillips, K. 1990. Where have all the frogs and toads gone? BioScience 40:422-424.
- Platt, D. R. 1969. Natural history of the Hognose Snakes *Heterodon platyrhinos* and *Heterodon nasicus*. Univ. Kan. Publ., Mus. Nat. History 18(4):253-420.
- Powell, G. L., and A. P. Russell. 1998. The status of short-horned lizards, *Phrynosoma douglasi* and *P. hernandezi*, in Canada. Canadian Field-Naturalist 112:1-16.
- Powell, G. L., A. P. Russell, and P. J. Fargey. 1998. The distribution of the Short-horned Lizard *Phrynosoma hernandezi* in Saskatchewan, Canada. Northwestern Naturalist 79:19-26.
- Redmond, R. L., M. M. Hart, J. C. Winne, W. A. Williams, P. C. Thornton, Z. Ma, C. M. Tobalske, M. M. Thornton, K. P. McLaughlin, T. P. Tady, F. B. Fisher, and S. W. Running. 1998. The Montana GAP Project: final report. Unpublished report. Montana Cooperative Wildlife Research Unit, The University of Montana, Missoula. xiii + 136 pp. + appendices.
- Reel, S. 1989. Vest-pocket preserves. Montana Outdoors 20(2):27-29.
- Reel, S., L. A. Schassberger, and W. Ruediger. 1989. Caring for our natural communities: Region 1 - threatened, endangered and sensitive species program. USDA, USFS, Northern Region, Missoula, Montana.
- Reichel, J. D. 1995a. Preliminary amphibian and reptile survey of the Lewis and Clark National Forest: 1994. Montana Natural Heritage Program. Helena, MT. 92 pp.
- Reichel, J. D. 1995b. Preliminary amphibian and reptile survey of the Sioux District of the Custer National Forest: 1994. Montana Natural Heritage Program. Helena, MT. 75 pp.
- Reichel, J. D. 1996. Preliminary Colonial Nesting Bird Survey of the Bureau of Land Management Lewistown District: 1995. Montana Natural Heritage Program. Helena, MT. 97 pp.
- Reichel, J. D. and D. L. Flath. 1995. Identification guide to the amphibians and reptiles of Montana. Montana Outdoors 26(3):15-34.
- Roedel, M. D., and P. Hendricks. 1998. Amphibian and reptile survey on the Bureau of Land Management Lewistown District: 1995-1998. Montana Natural Heritage Program. Helena, MT. 53 pp.

- Rogers, T. L., and W. L. Jellison. 1942. A collection of amphibians and reptiles from western Montana. *Copeia* 1942:10-13.
- Scow, K. L. 1978. Terrestrial wildlife survey, Zortman and Landusky areas, Little Rocky Mountains, MT. Tech. Rpt. for Zortman and Landusky Mining Co., Inc., by Westech, Inc.
- Secoy, D. M., and T. K. Vincent. 1976. Distribution and population status of Saskatchewan's amphibians and reptiles. Final report. Saskatchewan Department of Environment. Regina, Saskatchewan. 42 pp. [unnumbered]
- Semlitsch, R. D. 1998. Biological delineation of terrestrial buffer zones for pond-breeding salamanders. *Conservation Biology* 12:1113-1119.
- Semlitsch, R. D., and J. R. Bodie. 1998. Are small, isolated wetlands expendable? *Conservation Biology* 12:1129-1133.
- Shaffer, H. B., R. N. Fisher, and C. Daividsen. 1998. The role of natural history collections in documenting species declines. *Trends in Ecology and Evolution* 13:27-30.
- Smith, H. M. 1978. A guide to field identification Amphibians of North America. Golden Press, New York.
- Smith, H. M. and E. D. Brodie, Jr. 1982. Reptiles of North America. Golden Press, NY. 240 pp.
- Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. Second edition. Houghton Mifflin Co., Boston. xiv + 336 pp.
- Stewart, G. R. 1977. *Charina bottae*. Cat. Am. Amph. Rep. 205.1-205.2.
- Stuart, L. C. 1930. An extension of the range of *Coluber constrictor mormon* (Baird and Girard). *Copeia* 1930:44.
- Stukel, E. D., and D. C. Backland. 1997. Animal species monitored by the South Dakota Natural Heritage Program. *Prairie Naturalist* 29:179-213.
- Sweet, S. S. and W. S. Parker. 1990. *Pituophus melanolucus*. Cat. Am. Amph. Rept. 474.1-474.8.
- Thompson, L. S. 1982. Distribution of Montana amphibians, reptiles, and mammals. Montana Audubon Council. 24 pp.
- Timkin, R. L. and D. G. Dunlap. 1965. Ecological distribution of the two species of *Bufo* in southeastern South Dakota. *Proc. S. D. Acad. Sci.* 44:113-117.

- Tinkle, D. W., A. E. Dunham, and J. D. Congdon. 1993. Life history and demographic variation in the lizard *Sceloporus graciosus*: a long-term study. *Ecology* 74:2413-2429.
- U.S. Forest Service and Montana Department of State Lands. 1985. Jardine joint venture project.
- U.S. Forest Service and Montana Department of State Lands. 1986. Jardine joint venture project, final EIS.
- U.S. Geological Survey and Montana Department of State Lands. 1979. Draft, proposed mining and reclamation plan, Pearl Mine, Big Horn County, MT.
- U.S. Geological Survey and Montana Department of State Lands. No date. Draft environmental statement, proposed mining and reclamation plan, Spring Creek Mine, Big Horn County, MT.
- Visher, S. S. 1914. A preliminary report of the biology of Harding County northwestern South Dakota. *South Dakota Geological Survey Bulletin* 6:1-126.
- VTN. No date. Second year's analysis of terrestrial wildlife on proposed mine access and railroad routes in southern Montana and northern Wyoming, March 1979 - February 1980. Tech. Rep. prepared by VTN Wyoming, Inc., for Shell Oil Co.
- Webb, R. G. 1962. North American soft-shelled turtles (Family Trionychidae). *Univ. Kan. Publ., Mus. Nat. Hist.* 13:429-611.
- Webb, R. G. 1973. *Trionyx spinerfus*. *Cat. Amer. Amph. and Rept.* 140:1-4.
- Werner, J. K. 1974. *Phrynosoma douglassi brevirostre*. *Herp Review* 5(1): 20.
- Werner, J. K., T. Plummer, and J. Weaselhead. 1998. Amphibians and reptiles of the Flathead Indian Reservation. *Intermountain Journal of Science* 4:33-49.
- Werner, K. and J. D. Reichel. 1994. Amphibian and reptile survey of the Kootenai National Forest: 1994. *Montana Natural Heritage Program*. 105 pp.
- Westech, Inc. [Western Technology and Engineering]. 1981. The effects of the Tongue River Railroad on terrestrial wildlife. Technical Report for Tongue River Railroad Co.
- Westech, Inc. [Western Technology and Engineering]. 1982. Results of Phase one, step one, Little Rockies Project. Tech. Rpt. for Meridan Land and Mineral Co.
- Westech, Inc. [Western Technology and Engineering]. 1982. Wildlife reconnaissance, Cypress International Yellowstone Mine. Prepared for Hydrometrics, Inc.

Westech, Inc. [Western Technology and Engineering]. 1987. Valley View Hills: baseline easement report. The Nature Conservancy, Big Sky Field Office, Helena, MT. 44 pp. plus appendices.

Westech, Inc. [Western Technology and Engineering]. No date. Preliminary wildlife reconnaissance, Ruby and Little Ben mine areas, Little Rocky Mountains, Montana. Technical Report for Zortman and Landusky Mining Companies.

Western Ecological Services Co. 1983. Wildlife inventory of the Knowlton known recoverable coal resource area, MT. Prep. for USDI, BLM Cont. No. VA-553-RFP2-1027.

Western Ecological Services Co. 1983. Wildlife inventory of the Southwest Circle known recoverable coal resource area, MT. Prepared for U.S. Department of the Interior, BLM. Contract YA-553-RFP2-1027.

Wheeler, G. C. and J. Wheeler. 1966. The amphibians and reptiles of North Dakota. University of North Dakota, Grand Forks. 103 pp.

Wilson, L. D. 1978. *Coluber constrictor*. Cat. Am. Amph. Rep. 218.1-218.4.

Appendix 1. Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Carter County				
Reservoir in Foster Draw+	T1S R58E S31NWSW	3313	22 Jul	12:25
Ute Reservoir+	T2S R58E S9NWNE	3280	22 Jul	14:05
Blackfoot Reservoir+	T2S R58E S10NWNE	3247	22 Jul	15:05
Reservoir 1 mi SE Long Reservoir+	T2S R58E S13SWSE	3280	22 Jul	16:35
Reservoir and pond 1.7 mi W Sioux Reservoir+	T2S R58E S18NWNE	3346	22 Jul	18:00
Custer County				
Reservoir (W side) on Mizpah Creek Road+	T4N R51E S34NW	2729	4 Apr	14:00
Reservoir (E side) on Mizpah Creek Road+	T4N R51E S34SE	2716	4 Apr	13:10
Reservoir 1.6 km SW Moon Creek Road	T6N R46E S17SW	2611	11 Apr	14:45
Reservoir 2.4 km SW Moon Creek Road+	T6N R46E S20NW	2657	11 Apr	14:20
Spotted Eagle Rec. Area (marsh SE side of lake)	T7N R47E S4SW	2369	10 Apr	15:30
Ponds on E & W sides, Strevell Creek Road+	T7N R50E S26SW	3018	4 Apr	16:25
Murn, 2 mi NE Miles City	T8N R47E S17SWNE	2300	31 May	03:50
Sewage treatment ponds, Miles City	T8N R47E S25SWSW	2133	1 Jun	22:00
Ponds 3 mi E I-94, on Hwy 12	T8N R48E S27NWNW	2579	1 Jun	22:45
Reservoir on Norton Creek near Rattlesnake Butte	T8N R53E S16NWNE	2890	2 Jun	11:00
Archdale Creek, 10 mi E of Powder River+	T8N R53E S27SE	2854	27 Apr	14:10
Reservoir & wetland W of rest area on Hwy 12+	T8N R53E S27 (middle)	2723	3 Jun	07:30
Jones Creek area, Frontage Road of I-94	T9N R48E S29SWNE	2631	31 May	02:35
Reservoir 0.75 mi NE of Beardsley Reservoir+	T9N R52E S14NE	3028	2 Jun	18:00
Beardsley Reservoir+	T9N R52E S14SW	2601	2 Jun	13:45
Grimes Creek, 1 mi E of Hwy 59+	T10N R45E S20SE	2675	28 Jun	16:05
Mack Creek, on Frontage Road of I-94	T10N R49E S2E (middle)	2165	30 May	23:25
Miles Creek, on Frontage Road of I-94	T10N R49E S10SESE	2172	30 May	23:45

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 1 (cont.). Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Custer County (cont.)				
Pools on Harris Creek, N of Kinsey	T10N R49E S19SESW	2441	1 Jun	11:25
Pond, W side Yellowstone River 3 mi NE Kinsey+	T10N R49E S20SWSW	2201	31 May	16:00
Pools and wetland, Bonfield Fishing Access Road+	T10N R49E S20S (middle)	2103	1 Jun	07:00
Hay Creek, Frontage Road of I-94	T10N R49E S32NW	2415	31 May	01:45
Daniels County				
Flaxville Waterfowl Production Area	T35N R50E S8SENE, SESE	2756	29 May	12:40
Outlet Marsh Waterfowl Production Area	T37N R48E S1SENW	2460	29 May	16:15
Jagiello Waterfowl Production Area	T37N R49E S14SESE	2460	29 May	14:50
Dawson County				
Cedar Creek, 1.5 mi SE Bailer Reservoir+	T13N R55E S2SE	2198	29 Apr	13:50
Bailer Reservoir+	T13N R55E S3NE	2212	29 Apr	11:45
Bailer Reservoir+	T13N R55E S3NWNE	2212	23 Jul	13:55
Reservoir, S of Gertison Dam+	T13N R55E S11NESW	2300	23 Jul	15:30
Reservoir (dry) in N Pine Oil Field*+	T13N R55E S13SWNW	2350	23 Jul	15:00
Reservoir, 1 mi SW of Big Drop Reservoir+	T13N R56E S8SW	2346	29 Apr	14:30
Prairie Goat Reservoir+	T13N R56E S9NESW	2380	23 Jul	18:30
Big Drop Reservoir+	T13N R56E S9SW	2390	29 Apr	17:00
Big Drop Reservoir+	T13N R56E S9SW	2390	23 Jul	19:17
Upper Labell Reservoir+	T13N R56E S14SWNE	2419	24 Jul	09:56
Reservoir, 0.4 mi NE of Lower Labell Reservoir+	T13N R56E S15SENW	2410	24 Jul	08:25
Yellowstone River bottom+	T14N R55E S8NENW, NENE	2080	24 Jul	13:00
Yellowstone River Oxbow ponds+	T17N R56E S2SW	1978	28 Apr	19:30

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 1 (cont.). Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Fallon County				
Hay Creek Reservoir+	T8N R57E S31SW	2739	27 Apr	16:15
Pennell Creek Reservoir+	T8N R59E S25NW	3067	27 Apr	18:40
Garfield County				
Musselshell River tributary, 8 mi S of Mosby+	T13N R30E S20NE	2608	24 Jun	16:00
N. Fork Sage Hen Creek+	T15N R31E S30SW	2854	24 Jun	17:45
Teepee Creek, 14 mi S of Jordan+	T16N R37E S34NE	2854	25 Jun	16:05
Reservoir, road to Benzien N of Sand Springs+	T17N R32E S30SE	3051	1 May	16:30
Lone Tree Creek+	T17N R39E S27NW	2739	25 Jun	13:00
Lynch Coulee Reservoir+	T17N R39E S33NW	2821	25 Jun	11:30
Big Dry Creek+	T18N R39E S17NW	2526	4 May	15:30
Fork Reservoir+	T20N R42E S31SW	2421	19 May	12:00
Reservoir, off branch of Flat Creek+	T21N R41E S29NE	2493	19 May	14:55
Reservoir, branch of Snap Creek+	T21N R42E S18SE	2460	19 May	16:30
Reservoir, 14 mi N of Hwy 200+	T21N R42E S31NE	2395	19 May	18:05
Reservoir, S Fork Rock Creek tributary+	T23N R44E S29SE	2427	4 May	11:35
Game Reservoir, 2.5 mi E of Hwy 24+	T24N R44E S20SW	2460	2 May	13:00
McCone County				
Split reservoir+	T23N R43E S27NW	2352	8 Apr	12:30
Alkali Coulee Reservoir+	T26N R44E S25NW	2132	2 May	18:30
Musselshell County				
E Fork Razor Creek, 3 mi E of Hwy 87+	T5N R27E S31NE	3445	21 Jun	16:30
Alkali Creek+	T8N R25E S3SW	3395	21 Jun	10:15

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 1 (cont.). Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Musselshell County (cont.)				
Willow Creek, 7 mi NNW of Lake Mason+	T10N R24E S17NW	3592	21 Jun	14:00
Reservoir, 5 mi NW of Lake Mason+	T10N R24E S31NE	3773	21 Jun	12:10
Reservoir, off Colony Road 2 mi E of Hwy 87+	T11N R25E S9SE	3812	23 Jun	14:15
Little Wall Creek, 8 mi E of Hwy 87+	T11N R26E S14NW	3527	23 Jun	18:30
Reservoir, 7 mi E of Hwy 87+	T11N R26E S32NW	3592	23 Jun	16:10
Prairie County				
Williams Creek, on Frontage Road of I-94	T10N R49E S1N (middle)	2060	30 May	23:00
Tennile Creek, 10 mi S of Terry+	T10N R51E S3NE	2362	28 Apr	14:15
Custer Creek Reservoir+	T11N R49E S23NWSW	2569	1 Jun	09:30
Terry sewage ponds	T12N R51E S15NWNW	2519	30 May	22:00
South Fork Reservoir (wetland below res.)+	T13N R48E S17 (middle)	2962	30 May	09:30
Clark Reservoir+*	T13N R47E S13NE	2815	9 Apr	13:30
Clark Reservoir (downstream wetland)+	T13N R48E S18NWNW	2815	30 May	17:15
Silvertip Reservoir and downstream wetland+	T13N R48E S24SW	2706	1 May	17:10
Silvertip Reservoir+	T13N R48E S24SW	2706	30 Jun	13:15
Cedar Creek, 100 m down from highway crossing	T13N R50E S16NENW	2414	1 May	19:05
Terry Badlands Viewing Area+*	T13N R50E S32SW	2788	30 Jun	16:45
Coal Creek Reservoir, 6 mi NE of Terry+	T13N R51E S26SW	2306	24 Apr	13:30
Coal Creek Reservoir+	T13N R51E S26SW	2306	1 Jun	13:00
Homestead Reservoir+	T14N R49E S7NE	2795	24 Apr	17:20
Homestead Reservoir (downstream wetland)+	T14N R49E S6&7 (edge)	2782	29 May	10:30
Papps Reservoir, on Stouts Creek+	T14N R49E S26SW	2657	30 Jun	11:10
Cedar Creek+	T15N R48E S25SESW	2920	29 May	13:00

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 1 (cont.). Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Prairie County (cont.)				
Ban Reservoir+	T15N R48E S30SENW	2906	29 May	16:40
Ban Reservoir, 400 m NE+	T15N R48E S30SENW	2950	29 May	15:30
Richland County				
Missouri River Oxbow pond, 2 mi S of Culbertson+	T27N R56E S7NE	1916	20 May	14:00
Roosevelt County				
Wolf Creek, 2 mi W of Wolf Point	T27N R47E S17SW	2044	20 May	11:15
Smoke Creek, at Hwy 344	T30N R54E S18NWNE	1930	28 May	17:00
Rosebud County				
Armells Creek, oxbow marsh+	T4N R40E S26SWSW	2906	23 Apr	16:45
Reservation Creek, at I-94	T6N R38E S23SW	2641	26 Apr	17:30
Far West Fishing Access	T6N R42E S16NW	2477	26 Apr	16:00
Brown Coulee Reservoir+	T11N R37E S34SW	2808	29 Jun	12:30
Pond, 24 mi W of Ingomar+	T11N R38E S35SE	2788	29 Jun	15:30
Stellar Creek+*	T11N R39E S30SW	2706	29 Jun	16:45
Trail Creek Reservoir+	T11N R41E S10SW	3034	28 Jun	14:30
Sunday Butte Reservoir+	T12N R41E S32NE	3018	28 Jun	12:30
Sheridan County				
Medicine Lake NWR, entrance pond*	T32N R56E S31NWNW	1940	31 May	12:10

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 1 (cont.). Site surveys for amphibian and reptiles during 1998 within the Miles City District, BLM.

SITE	LOCATION	ELEV.	DATE	START TIME
Wibaux County				
Lame Steer National Wildlife Refuge	T12N R60E S14NWSW, S15NW	2887	23 July	10:50
Yellowstone County				
Railroad Creek, on Castle Butte Road+	T4N R30E S27NW	3034	22 Jun	17:00
Buffalo Creek, 1 mi E of Custer-Pine View Road+	T5N R33E S26NE	2920	22 Jun	12:10
Antelope Creek, at Pine View Road+	T6N R30E S25SE	3215	22 Jun	14:30

* Sites with no amphibians or reptiles detected during survey. + BLM ownership.

Appendix 2. Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Carter County		
Reservoir in Foster Draw	0:45	RAPI (5), THRA (1)
Ute Reservoir	0:30	PSTR (*), RAPI (4*), THRA (1)
Blackfoot Reservoir	0:40	RAPI (5), THRA (22)
Reservoir 1 mi SE Long Reservoir	0:25	RAPI (4), THRA (1)
Reservoir and pond 1.7 mi W Sioux Reservoir	0:25	RAPI (1)
Custer County		
Reservoir (W side) on Mizpah Creek Road	0:20	PSTR (5-10)
Reservoir (E side) on Mizpah Creek Road	0:30	PSTR (5-10)
Reservoir 1.6 km SW Moon Creek Road	1:15	PSTR (5-10), RAPI (25-50)
Reservoir 2.4 km SW Moon Creek Road	1:35	PSTR (5-10)
Spotted Eagle Rec. Area (marsh SE side of lake)	3:00	PSTR (50-100), RAPI (6*), CHPI (2)
Ponds on E & W sides, Strevell Creek Road	0:50	PSTR (25-50), RAPI (2), CHPI (1)
Murn, 2 mi NE Miles City	0:10	PSTR (25+)
Sewage treatment ponds, Miles City	0:05	PSTR (50+)
Ponds 3 mi E I-94, on Hwy 12	0:10	PSTR (50+)
Reservoir on Norton Creek near Rattlesnake Butte	1:05	BUWO (*), PSTR (*), RAPI (*), CHPI (1)
Archdale Creek, 10 mi E of Powder River	1:20	PSTR (50+), RAPI (3), CHPI (4)
Reservoir & wetland W of rest area on Hwy 12	1:00	BUWO (*), PSTR (*), RAPI (*), CHPI (2)
Jones Creek area, Frontage Road of I-94	0:10	PSTR (30+)
Reservoir 0.75 mi NE of Beardsley Reservoir	1:00	AMTI (*)
Beardsley Reservoir	2:00	BUWO (1*), RAPI (93*), CHPI (1), COCO (1)
Grimes Creek, 1 mi E of Hwy 59	0:55	RAPI (6)
Mack Creek, on Frontage Road of I-94	0:05	PSTR (20+)

AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), BOCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

Appendix 2 (cont.). Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Custer County (cont.)		
Miles Creek, on Frontage Road of I-94	0:45	BUWO (10+), PSTR (30+*), SPBO (10+)
Pools on Harris Creek, N of Kinsey	0:05	PSTR (2+)
Pond, W side Yellowstone River 3 mi NE Kinsey	0:30	AMTI (*), PSTR (5+*), RAPI (5*)
Pools and wetland, Bonfield Fishing Access Road	1:00	AMTI (*), PSTR (*)
Hay Creek, Frontage Road of I-94	0:10	PSTR (50+)
Daniels County		
Flaxville Waterfowl Production Area	1:00	RAPI (3)
Outlet Marsh Waterfowl Production Area	0:35	AMTI (*)
Jagiello Waterfowl Production Area	0:35	PSTR (4*)
Dawson County		
Cedar Creek, 1.5 mi SE Bailer Reservoir	0:30	BUCO (1)
Bailer Reservoir	1:10	PSTR (100+), RAPI (6)
Bailer Reservoir	0:30	AMTI (*), BUWO (1), RAPI (1), THRA (1)
Reservoir, S of Gertison Dam	0:20	RAPI (7), THRA (1)
Reservoir (dry) in N Pine Oil Field	0:05	no herps
Reservoir, 1 mi SW of Big Drop Reservoir	2:00	PSTR (100+), RAPI (6)
Prairie Goat Reservoir	0:30	RAPI (30), CHPI (2)
Big Drop Reservoir	1:30	PSTR (10-25), RAPI (3)
Big Drop Reservoir	0:20	RAPI (7)
Upper Labell Reservoir	1:00	AMTI (*), RAPI (10), CHPI (1), THRA (1)
Reservoir, 0.4 mi NE of Lower Labell Reservoir	0:30	BUWO (*), RAPI (2)
Yellowstone River bottom	1:10	BUWO (3*), RAPI (5), CHPI (1)

AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), BOCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

Appendix 2 (cont.). Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Dawson County (cont.)		
Yellowstone River Oxbow ponds	1:30	BUWO (10+), PSTR (10+), RAPI (3)
Fallon County		
Hay Creek Reservoir	1:45	PSTR (1-10), RAPI (1)
Pennell Creek Reservoir	1:30	PSTR (100+)
Garfield County		
Musselshell River tributary, 8 mi S of Mosby	1:15	BUCO (1*), RAPI (*)
N. Fork Sage Hen Creek	0:45	PSTR (5-10)
Teepee Creek, 14 mi S of Jordan	0:55	BUCO (1), PSTR (*), RAPI (1*)
Reservoir, road to Benzien 12 mi N of Sand Springs	1:00	PSTR (1-10)
Lone Tree Creek	1:30	RAPI (2*), THRA (1)
Lynch Coulee Reservoir	0:45	RAPI (1)
Big Dry Creek	1:20	BUCO (1), RAPI (9)
Fork Reservoir	2:10	RAPI (15), CHPI (25+), COCO (1), THRA (2)
Reservoir, off branch of Flat Creek	0:40	PSTR (10-25), RAPI (6), THRA (1)
Reservoir, branch of Snap Creek	0:45	BUCO (1), PSTR (*), RAPI (25-50), THRA (1)
Reservoir, 14 mi N of Hwy 200	0:45	PSTR (*), COCO (1)
Reservoir, S Fork Rock Creek tributary	0:55	PSTR (50+), RAPI (2)
Game Reservoir, 2.5 mi E of Hwy 24	1:30	PSTR (50+), RAPI (40*), CHPI (1)
McCone County		
Split reservoir	1:30	PSTR (25+), RAPI (3)
Alkali Coulee Reservoir	1:20	PSTR (1-10)

AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), BOCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

Appendix 2 (cont.). Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Musselshell County		
E Fork Razor Creek, 3 mi E of Hwy 87	1:15	AMTI (*), PSTR (*), RAPI (*)
Alkali Creek	1:00	AMTI (*), PSTR (25+*), THRA (1)
Willow Creek, 7 mi NNW of Lake Mason	1:15	RAPI (5)
Reservoir, 5 mi NW of Lake Mason	1:05	PSTR (50+)
Reservoir, off Colony Road 2 mi E of Hwy 87	0:45	PSTR (*), THRA (1)
Little Wall Creek, 8 mi E of Hwy 87	1:00	PSTR (10-25), THRA (1)
Reservoir, 7 mi E of Hwy 87	1:20	PSTR (50+)
Prairie County		
Williams Creek, on Frontage Road of I-94	0:15	PSTR (5+)
Tennile Creek, 10 mi S of Terry	1:45	PSTR (10+), RAPI (9), THRA (1)
Custer Creek Reservoir	1:00	PSTR (*), RAPI (9*)
Terry sewage ponds	0:05	PSTR (25+)
South Fork Reservoir (wetland below res.)	1:00	PSTR (*), RAPI (28*), THRA (2)
Clark Reservoir	1:30	no herps
Clark Reservoir (downstream wetland)	1:25	PSTR (1*), RAPI (17*), CHPI (2)
Silvertip Reservoir and downstream wetland	1:00	BUWO (1), PSTR (3+*), RAPI (*)
Silvertip Reservoir	1:30	BUCO (*), PSTR (*)
Cedar Creek, 100 m down from highway crossing	1:00	PSTR (*), RAPI (1)
Terry Badlands Viewing Area	1:45	no herps
Coal Creek Reservoir, 6 mi NE of Terry	2:50	AMTI (*), PSTR (*), RAPI (5-10)
Coal Creek Reservoir	1:00	BUWO (*), PSTR (*), RAPI (4*)
Homestead Reservoir	1:10	PSTR (1), RAPI (1), CHPI (2)
Homestead Reservoir (downstream wetland)	1:15	AMTI (*), PSTR (*), RAPI (3*), CHPI (12), THRA (1)

AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), BOCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

Appendix 2 (cont.). Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Prairie County (cont.)		
Papps Reservoir, on Stouts Creek	0:50	PSTR (*)
Cedar Creek	1:00	RAPI (23*)
Ban Reservoir	0:45	CHPI (5)
Ban Reservoir, 400 m NE	0:20	PSTR (*), RAPI (3*)
Richland County		
Missouri River Oxbow pond, 2 mi S of Culbertson	1:15	BUWO (1), PSTR (10-25), RAPI (8), COCO (1)
Roosevelt County		
Wolf Creek, 2 mi W of Wolf Point	0:30	RAPI (3), THRA (1)
Smoke Creek, at Hwy 344	0:15	RAPI (2)
Rosebud County		
Armells Creek, oxbow marsh	1:15	PSTR (50+), RAPI (5-10), THSI (1)
Reservation Creek, at I-94	1:30	PSTR (100+), RAPI (6)
Far West Fishing Access	1:10	PSTR (5-10)
Brown Coulee Reservoir	1:10	PSTR (*)
Pond, 24 mi W of Ingomar	0:40	PSTR (2-5), RAPI (1)
Stellar Creek	0:45	no herps
Trail Creek Reservoir	1:00	PSTR (*), THRA (1)
Sunday Butte Reservoir	1:30	AMTI (*), PSTR (10-25*), THRA (1)

AMTI (*Ambystoma tigrinum*), BUWO (*Bufo woodhousii*), COCO (*Bufo cognatus*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*), RAPI (*Rana pipiens*), CHPI (*Chrysemys picta*), COCO (*Coluber constrictor*), THRA (*Thamnophis radix*), THSI (*Thamnophis sirtalis*).

Appendix 2 (cont.). Amphibian and reptile species detected during 1998 surveys within the Miles City District, BLM.

SITE	SEARCH (hrs.min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Sheridan County		
Medicine Lake NWR, entrance pond	0:30	no herps
Wibaux County		
Lame Steer National Wildlife Refuge	1:00	RAPI (14), THRA (1)
Yellowstone County		
Railroad Creek, on Castle Butte Road	1:10	AMTI (*), BUWO (1*), PSTR (*)
Buffalo Creek, 1 mi E of Custer-Pine View Road	1:20	PSTR (*)
Antelope Creek, at Pine View Road	1:00	PSTR (*)
AMTI (<i>Ambystoma tigrinum</i>), BUWO (<i>Bufo woodhousii</i>), BOCO (<i>Bufo cognatus</i>), PSTR (<i>Pseudacris triseriata</i>), SPBO (<i>Spea bombifrons</i>), RAPI (<i>Rana pipiens</i>), CHPI (<i>Chrysemys picta</i>), COCO (<i>Coluber constrictor</i>), THRA (<i>Thamnophis radix</i>), THSI (<i>Thamnophis sirtalis</i>).		

Appendix 3a. Site surveys for amphibians and reptiles during 1995 in Carbon County, on Miles City District, BLM lands.

SITE	LOCATION	ELEV.	DATE	START TIME
Stock ponds (not on map), W side of road	T7S R23E S33NE	3865	29 Jun	11:45
Depression Reservoir*	T7S R24E S29SW	4160	29 Jun	14:00
Reservoir 6.5 mi NW of Warren	T82 R24E S12SE, S13NE	4610	30 Jun	10:00
Reservoir on Grove Creek, 2 mi W of Hwy 72*	T9S R22E S6SW	4050	2 Jul	16:50
Silver Tip Creek*	T9S R23E S19NE	4170	2 Jul	14:10
Well and stock tanks, Beaver Canyon Road*	T9S R26E S13SE	4744	1 Jul	08:50
Stock pond (not on map), N side of Pipeline Road	T9S R26E S31SE	4360	1 Jul	12:05
Gyp Spring and 200 m downstream*	T9S R27E S33SW	4610	1 Jul	17:25

* Sites with no amphibians or reptiles detected during survey.

Appendix 3b. Amphibian and reptile species detected during 1995 Carbon County surveys, Miles City District, BLM.

SITE	SEARCH (hrs:min)	SPECIES (n = adult & juv.; * = eggs, larvae, tadpoles)
Stock ponds (not on map), W side of road	0:25	AMTI (*), SPBO (*)
Depression Reservoir	0:05	no herps (reservoir dry)
Reservoir 6.5 mi NW of Warren	0:40	AMTI (*), PSTR (*), SPBO (*)
Reservoir on Grove Creek, 2 mi W of Hwy 72	0:25	no herps
Silver Tip Creek	0:15	no herps
Well and stock tanks, Beaver Canyon Road	0:05	no herps
Stock pond (not on map), N side of Pipeline Road	0:15	AMTI (*), SPBO (*)
Gyp Spring and 200 m downstream	0:20	no herps

* AMTI (*Ambystoma tigrinum*), PSTR (*Pseudacris triseriata*), SPBO (*Spea bombifrons*).

Appendix 4. Opportunistic observations of amphibians and reptiles within the Miles City District, BLM during 1998 surveys, except for Carbon County, when observations were made during 1995.

SITE	LOCATION	DATE
<i>Ambystoma tigrinum</i>		
Carbon County: 1.5 mi NW of Gyp Spring (adult in pitfall trap)	T9S R27E S29SW	25 Sep 95
<i>Pseudacris triseriata</i>		
Carbon County: 8.5 mi SSW of Belfry, irrigation ditch (2 calling adults)	T9S R22E S18SE	27 Jun 95
Carbon County: 2.5 mi NE of Belfry, irrigation ditch (6 calling adults)	T8S R23E S6NW	28 Jun 95
Carbon County: 1.25 mi NE of Belfry, flooded field (6 calling adults)	T8S R22E S11NW	28 Jun 95
Carbon County: 5.5 mi S of Bridger (2-3 calling adults)	T7S R23E S17SW	29 Jun 95
Carbon County: pond 1 mi E of Hwy 72, beyond church (4-6 calling adults)	T8S R22E S2SE	2 Jul 95
Daniels County: Navaho, Middle Fork Eagle Creek (3 calling adults)	48°47.4'N 105°3.6'W	29 May 98
Prairie County: Brackett Creek, 9 mi S of Terry at Hwy 59 (5-10 calling adults)	T13N R50E S15SE	9 Apr 98
Prairie County: Cedar Creek, 10 mi S of Terry along Hwy 59 (5-10 calling adults)	T13N R50E S16NW	9 Apr 98
Sheridan County: Syme Slough, 2 mi N of Raymond on Hwy 16 (>10 calling adults)	T36N R54E S1NW	21 May 98
Sheridan County: Westby (>4 calling adults)	T36N R58E S13SESE	30 May 98
Yellowstone County: Valley Creek, 6 mi NW of Park City (>10 calling adults)	T1S R22E S34NESW	22 Apr 98
Yellowstone County: Billings KOA campground, Yellowstone River (>10 calling adults)	T1S R26E S11SW	22 Apr 98
<i>Rana pipiens</i>		
Carter County: Long Reservoir, 15 mi S of Ekalaka (1 adult)	T2S R58E S14NENW	22 Jul 98
Custer County: BLM recreation area, 6 mi NE of Miles City (3 adults)	S149996N 443630E	31 May 98
Dawson County: Gertison Dam Reservoir, S of Glendive (2 juveniles)	T13N R55E S11NWNE	23 Jul 98
Golden Valley County: Musselshell River, 9 mi E of Ryegate (3 adults)	T6N R21E S3SW	23 Jun 98
Musselshell County: Melstone, 200 m E of town (1 adult, 10 tadpoles)	T10N R31E S29SW	24 Jun 98

Appendix 4 (cont.). Opportunistic observations of amphibians and reptiles within the Miles City District, BLM during 1998 surveys, except for Carbon County, when observations were made during 1995.

SITE	LOCATION	DATE
<i>Rana pipiens</i> (cont.)		
Prairie County: Cedar Creek, 1.75 mi upstream of river confluence (1 adult)	5185875N 480093E	1 Jun 98
Sheridan County: Medicine Lake, 0.5 mi S of Medicine Lake townsite (3 adults)	T32N R55E S25SE	20 May 98
Sheridan County: Eagle Creek, 1 mi W of Redstone at Hwy 5 (10 adults/juveniles)	T35N R52E S6NE	21 May 98
Wheatland County: Musselshell River, 2 mi E of Shawmut (2 adults)	T7N R18E S32NE	23 Jun 98
Yellowstone County: 0.7 mi E of Shepherd (2 adults)	T2N R27E S2SESE	25 Jul 98
<i>Chrysemys picta</i>		
Garfield County: Hwy 200, 12.5 mi E of Sand Springs at Haislett Creek (adult male)	47°10.3'N 107°15.8'W	31 May 98
Musselshell County: Hwy 12 near Delphia, 18 mi E of Roundup (adult roadkill)	T9N R28E S27NE	23 Jun 98
Sheridan County: Medicine Lake National Wildlife Refuge (2 adults)	T32N R57E S32SESW	30 May 98
<i>Phrynosoma hernandesi</i>		
Carbon County: near Swamp Frog Mine, 3.5 mi N of Gyp Spring (1 juvenile)	T9S R27E S17NE	11 Sep 95
Carbon County: Bear Canyon drainage near Gyp Spring Road crossing (dead adult)	T9S R26E S9NW	12 Sep 95
<i>Sceloporus graciosus</i>		
Carbon County: 1.5 mi N of Gyp Spring (1 adult)	T9S R27E S30NE	6 Sep 95
Carbon County: 1.5 mi N Gyp Spring (2 adults)	T9S R27E S29NE	7, 12 Sep 95
Carbon County: mouth of Bear Canyon (3 adults)	T9S R26E S4SW	7, 25 Sep 95
Carbon County: near Swamp Frog Mine, 3.5 mi N of Gyp Spring (4 adults)	T9S R27E S17SE, NE	8, 26 Sep 95

Appendix 4 (cont.). Opportunistic observations of amphibians and reptiles within the Miles City District, BLM during 1998 surveys, except for Carbon County, when observations were made during 1995.

SITE	LOCATION	DATE
<i>Sceloporus graciosus</i> (cont.)		
Carbon County: Crooked Creek Road, 3 mi N of Gyp Spring (1 adult)	T9S R27E S16NE	10 Sep 95
Carbon County: 1.5 mi NW of Gyp Spring (1 juvenile)	T9S R27E S30SE	25 Sep 95
Carbon County: 1.5 mi NW of Gyp Spring (1 adult, 1 juvenile)	T9S R27E S29SW	25 Sep 95
Carbon County: 1.5 mi N of Gyp Spring (3 adults)	T9S R27E S20SE	26 Sep 95
<i>Liochlorophis</i> (=Opheodrys) vernalis		
Sheridan County: Erickson Waterfowl Production Area (dead juvenile)	T33N R58E S24/25	7 Jul 98
Sheridan County: Westby City Park (dead adult)	T36N R58E S13ESE	28 Aug 98
<i>Pituophis catenifer</i>		
Carbon County: Silver Tip Creek Road at N end of Elk Basin Oil Field (dead adult)	T9S R23E S29NW	2 Jul 95
Carbon County: Silver Tip Creek Road (dead adult)	T8S R23E S19NW	2 Jul 95
Carter County: 6.4 mi N of Hammond, on Hammond Road (dead adult)	47°17'11"N 104°50'19"W	22 Jul 98
Custer County: Hwy 12, 25 mi E of Miles City (dead adult)	5141648N 468483E	1 Jun 98
Garfield County: junction of Sand Springs Road and Hwy 200 (dead adult)	T16N R33E S36SW	1 May 98
Garfield County: Hwy 200, 9 mi W of Jordan (dead adult)	T17N R36E S2SW	1 May 98
Garfield County: Hwy 24, N of Hwy 200 (dead adult)	T21N R43E SINW	4 May 98
Garfield County: Hwy 24, 21 mi S of Ft. Peck Reservoir spillway (dead adult)	T23N R43E S13SW	19 May 98
McCone County: Hwy 24, 7 mi N of Hwy 200 (dead adult)	47°25.3'N 106°10.3'W	28 May 98
Prairie County: Dry Creek Road (dead adult)	5191597N 474160E	1 Jun 98
Prairie County: Cherry Creek Road, NW of Terry (dead adult)	T13N R49E S11SW	30 Jun 98
Roosevelt County: 2 mi E of Hwy 13, 10 mi SE of Wolf Point (dead adult)	T26N R48E SINW	17 May 98

Appendix 4 (cont.). Opportunistic observations of amphibians and reptiles within the Miles City District, BLM during 1998 surveys, except for Carbon County, when observations were made during 1995.

SITE	LOCATION	DATE
<i>Pituophis catenifer</i> (cont.)		
Roosevelt County: Hwy 344, near Big Muddy Creek (dead adult)	48°20.5'N 104°34.8'W	28 May 98
<i>Coluber constrictor</i>		
Garfield County: road 1 mi N of Woody Creek and 10 mi N of Hwy 200 (adult)	T20N R41E S15NW	19 May 98
Musselshell County: Hwy 12 near Delphia, 16 mi E of Roundup (dead adult)	T9N R28E S28SW	23 Jun 98
Prairie County: Dry Creek Road (adult)	S191597N 474160E	1 Jun 98
Rosebud County: County Road 203, 8 mi W of Angela (adult)	T11N R43E S7NW	28 Jun 98
<i>Heterodon nasicus</i>		
Custer County: Hwy 59, 17 mi N of Miles City (dead adult)	T10N R45E S32NE	28 Jun 98
Garfield County: Hwy 59, 4 mi SSE of Jordan (dead adult)	T18N R38E S34SE	25 Jun 98
<i>Thamnophis radix</i>		
Carter County: on Road 323, 8 mi S of Belltower (dead adult)	45°34'10"N 104°22'52"W	22 Jul 98
Fallon County: on Hwy 7, 1 mi S of Willard (dead juvenile)	46°10'51"N 104°22'36"W	23 Jul 98
Garfield County: Sand Springs Road, 0.1 mi N of Sand Springs (dead adult)	T16N R33E S36SW	1 May 98
Roosevelt County: road 6.5 mi E of Hwy 13, 15 mi SE of Wolf Point (dead juvenile)	T26N R49E S34SE	17 May 98
Sheridan County: Syme Slough, 2 mi N of Raymond (adult)	T36N R54E S1NW	21 May 98
Sheridan County: 2.5 mi SE of Antelope, on Hwy 16 (dead adult)	T34N R56E S31SENW	31 May 98
Wibaux County: on Hwy 7, 12 mi S of Wibaux (dead adult)	46°48'27"N 104°13'33"W	23 Jul 98

Appendix 4 (cont.). Opportunistic observations of amphibians and reptiles within the Miles City District, BLM during 1998 surveys, except for Carbon County, when observations were made during 1995.

SITE	LOCATION	DATE
<i>Crotalus viridis</i>		
Carbon County: 3.5 mi NE of Warren, on road (juvenile)	T9S R26E S6NW	2 Jul 95
Carbon County: 1.5 mi N of Gyp Spring (adult)	T9S R27E S30SE	7 Sep 95
Carbon County: Pipeline Road, 3 mi NE of Frannie, Wyoming (adult)	T9S R25E S25SE	9 Sep 95
Carbon County: Crooked Creek Road, 5 mi N of Gyp Spring (adult)	T9S R27E S10NW	11 Sep 95
Carter County: Chalk Butte Road, 1.7 mi S of Pershing Cutoff (dead adult)	45°45'26"N 104°36'36"W	22 Jul 98
Garfield County: Hwy 24, N of Hwy 200 (dead adult)	T21N R43E S25SW	4 May 98
Rosebud County: County Road 103, 2 mi E of Hwy 12 S of Ingomar (dead adult)	T9N R36E S8SE	29 Jun 98
Yellowstone County: Hwy 87, 8 mi N of Billings (dead adult)	T3N R26E S35NW	21 Jun 98